First Copy

MAY
1934

FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets

FEATURES OF THIS ISSUE:

Operating a Bakery Fleet
Morris Cohen

After 100,000 Miles—Then What?
F. C. Fiechter

Passenger Cars for Fleet Use
L. V. Newton

What We Expect in a 1½-Tonner
Jean Babin

Gear Ratios for Sales Cars
Charles Reedy

Question-of-the-Month Club

What do CHAMPIONS' Universal Racing Victories Mean to Bus and Truck Operators?

Plenty! We know of no more striking proof that Champion Spark Plugs make every engine a better performing engine, than the fact that for the past ten years practically every major racing event *throughout the world* has been won with Champions.

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FRANCE—G. E. T. Eyston broke the world's hour record in a Champion equipped Panhard at 133.01 m. p. h., and records for 100 miles and 200 kilometers at Montlhery track.

FLORIDA—H. Tennes won the International Class "X" Championship. All American, English, French, Italian, Spanish, Swedish and Hungarian drivers, excepting one, used Champions.

COLUMBUS, OHIO—Buckeye Stages, Inc., won the 1933 Bus Transportation Maintenance Award using Champion Spark Plugs exclusively for maximum efficiency and economy.

FLORIDA—A. Becchi driving his record holding 12 litre boat "Lia V", won the world's championship in that class. All boats, American and Italian, used Champions.

SAVANNAH, GA.—Bob McKenzie driving a Champion equipped Studebaker, was checked in by Western Union 40 hours and 37 minutes after leaving Los Angeles.

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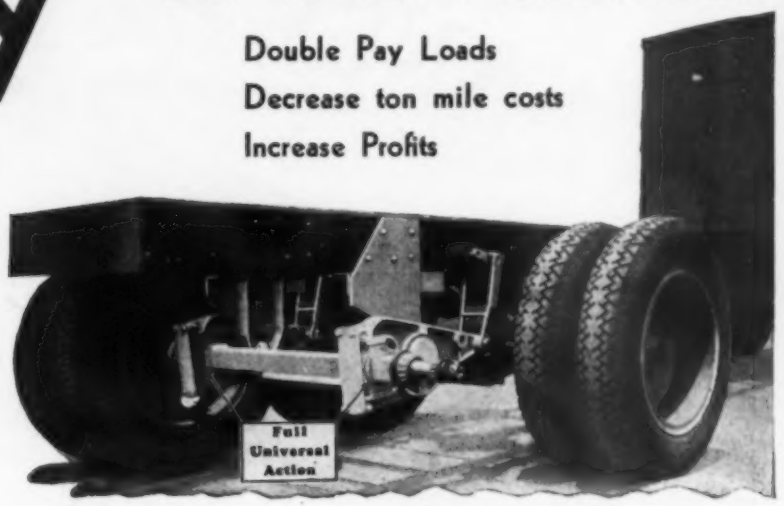
Six Wheel Attachments

Double Pay Loads
Decrease ton mile costs
Increase Profits



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In the United States ·/.

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3. Brake reaction equalized.
4. Maximum flexibility and simplicity.
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10 Years of Six-Wheel Attachment Manufacturing

THE ANSWER IS TIN PLATED Pistons

Mack, White, GMC and several passenger car builders have already found the answer to lower maintenance costs and vastly increased mileage for pistons and cylinder walls. It is *tin-plated pistons.*

Tin-plated Pistons can be fitted with half the regular clearances and still not bind or score.

Tin-plated Pistons eliminate the extravagant "break-in" wear of ordinary pistons. (It is a known fact that the first 500 miles of this "initial wear" is equivalent to the next 20,000.)

Tin-plated Pistons permit immediate engine operation at practically full speed and power — therefore immediate working efficiency for your cars and trucks.

Tin's low co-efficient of friction and its self-lubricating quality make it an ideal bearing metal, which in itself adds greatly to the life of the pistons and cylinders.

The plating of tin, which is plastic and "cold flows" into the many irregularities of the cylinder wall and piston, forms a more efficient power seal, reducing blow-by, oil pumping, crankcase dilution and plug fouling.

Don't overlook this new opportunity to lower your maintenance costs. Many Thompson Products jobbers now have machine shop equipment for tin-plating pistons in any size or oversize, for all cars and trucks. Those not yet equipped can get tin-plated pistons for you direct from our factory.

WRITE FOR OUR FOLDER "*Facts about tin-plated pistons*"

THOMPSON PRODUCTS, Inc.

General Offices: Cleveland, Ohio, U. S. A.
Factories: Cleveland and Detroit

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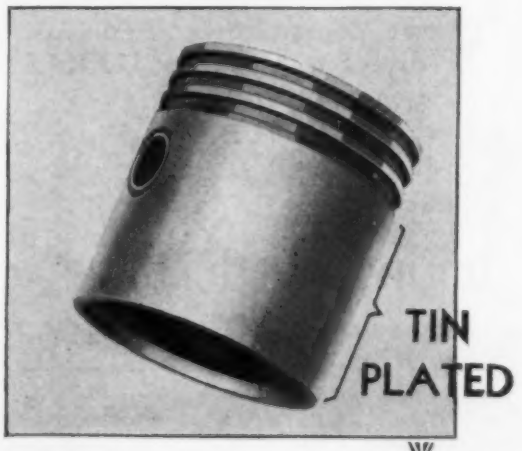
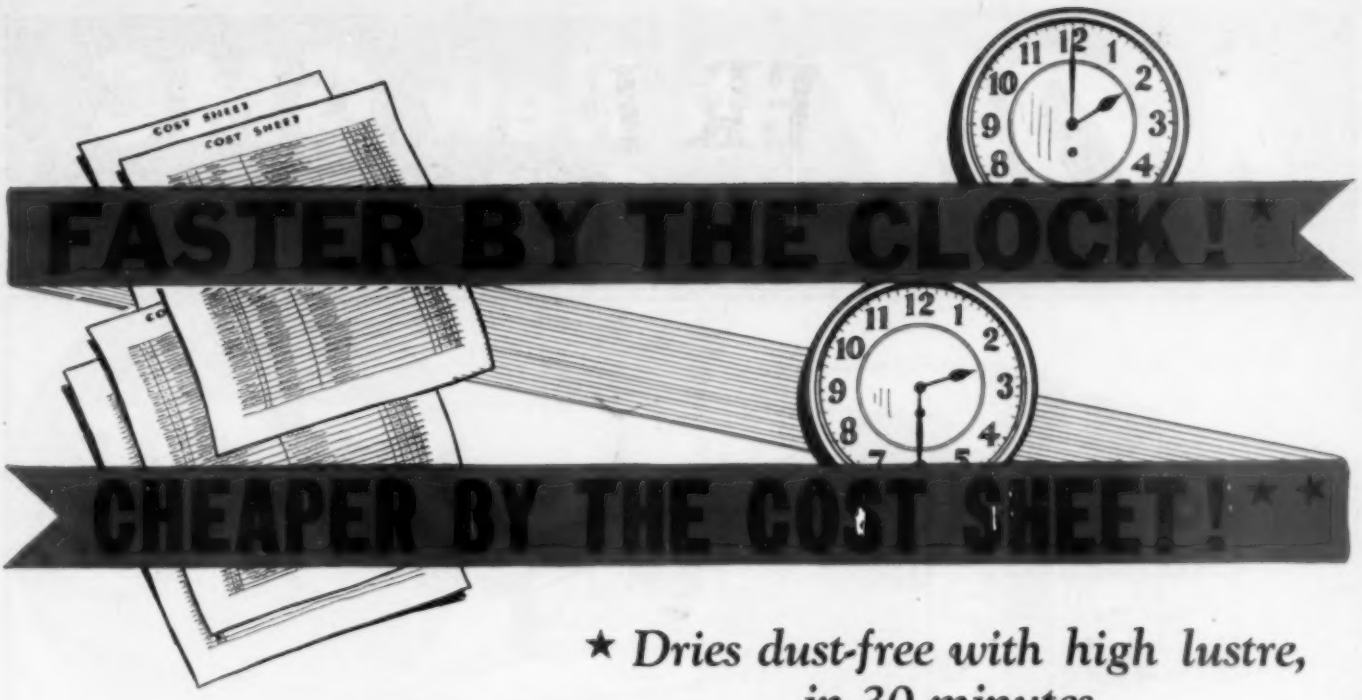
"THE *ONLY* COMPLETE PISTON SERVICE"

Alloy and Cast Iron, exact duplicates of original equipment, including Tin-plated, Cam-ground, plain alloy, split skirt, Invar-strut, Lo-ex, Tungtite, Heavy Duty Pistons . . . and Thompson *Chrome-Plated* Piston pins.



Thompson Products

Say "I saw it in FLEET OWNER"—It Helps!



FASTER BY THE CLOCK! ★

CHEAPER BY THE COST SHEET! ★★

★ *Dries dust-free with high lustre, in 30 minutes*

★★ *Easy handling and long life cut ton-mile refinishing costs*

DITZCO Enamel Quick-Set saves time and money. That's why so many big fleets have standardized on it.

Ditzco Enamel Quick-Set sprays perfectly. Covers better. Goes farther. Dries with a hard, smooth, weather-resistant surface, of high lustre. Wears better—keeps your trucks out of the shop longer—cuts your refinishing costs.

The Ditzler jobber organization is growing fast, which means there's one near you with complete stocks. Ask him, or write direct to us for further information on Ditzler's newest and most popular fleet finish—Ditzco Enamel Quick-Set. Get the facts today!

DITZCO ENAMEL QUICK-SET

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DITZLER COLOR COMPANY, 8000 W. Chicago Blvd., Detroit, Mich.

Say "I saw it in FLEET OWNER"—It Helps!

NOW A New GMC 1½-2 Ton Truck

Truck-Built Throughout—Full-Floating Rear Axle—Smart Streamlined Styling—Complete Line of Bodies!

Now—you can have GMC's newest and finest example of light duty truck designing—the truck that you have *always* wanted but *never* could get—a *real* truck, with all the stamina, rugged construction, dependability, and economy of operation for which GMC trucks are famous—*all at a price only a few dollars more than that of an ordinary light duty truck!*

This new GMC T-16 is an amazing achievement in value-giving! 9300 pounds gross rating! A 70-h. p. engine developing 147 ft. lbs. torque! Full-floating rear axle! Smart, modern, streamlined bodies, in a complete range of types—panel, canopy, stake, express and platform!

Don't take our word alone. See this remarkable new GMC value yourself. Compare its features. Note its size, its strength of construction, its beauty, its appearance of extraordinary quality—through and through. *There is nothing else like it, anywhere near its price!* Those who use and those who sell trucks will say that it eclipses all previous efforts in the light duty field!

Write for further information today!

A Combination of Features Never Before Offered in a Truck at This Price

70 H.P., 147 Ft. Lbs. Torque

Rifle-Drilled Connecting Rods.
Electroplated Pistons.
Removable Steel-Backed Main and Connecting Rod Bearings.

Full-Floating Rear Axle

Heavy Duty Truck-Type Clutch.
Heavy Four-Speed Transmission.
Needle Bearing Universal Joints.

Heavy Straight Truck-Type Frame

Centrifuse Rear Brake Drums.
Special Steel, Full-Capacity Springs.
Spoksteel Wheels.

GENERAL MOTORS TRUCK COMPANY
PONTIAC, MICHIGAN

Say "I saw it in FLEET OWNER"—It Helps!

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

VOL. 12 New York, May, 1934 No. 5

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this or *this*

Don't blame the driver

He needs your sympathy or better still a HOOF Stabilizer.

Shimmy breaks down tires, chassis and the nerves of even your best driver and it

is unnecessary

HOOF stabilizers will straighten out the course of the jiggliest, wiggliest truck or passenger car. They are made in sizes to fit all makes.

You don't have to buy untried. HOOF Stabilizers are sold on trial order, but don't expect your money back because you will never ask for it.

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For light trucks and all passenger cars with I Beam axles. List...$6.00

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Send order today—10 day Money-back guarantee. Quickly installed

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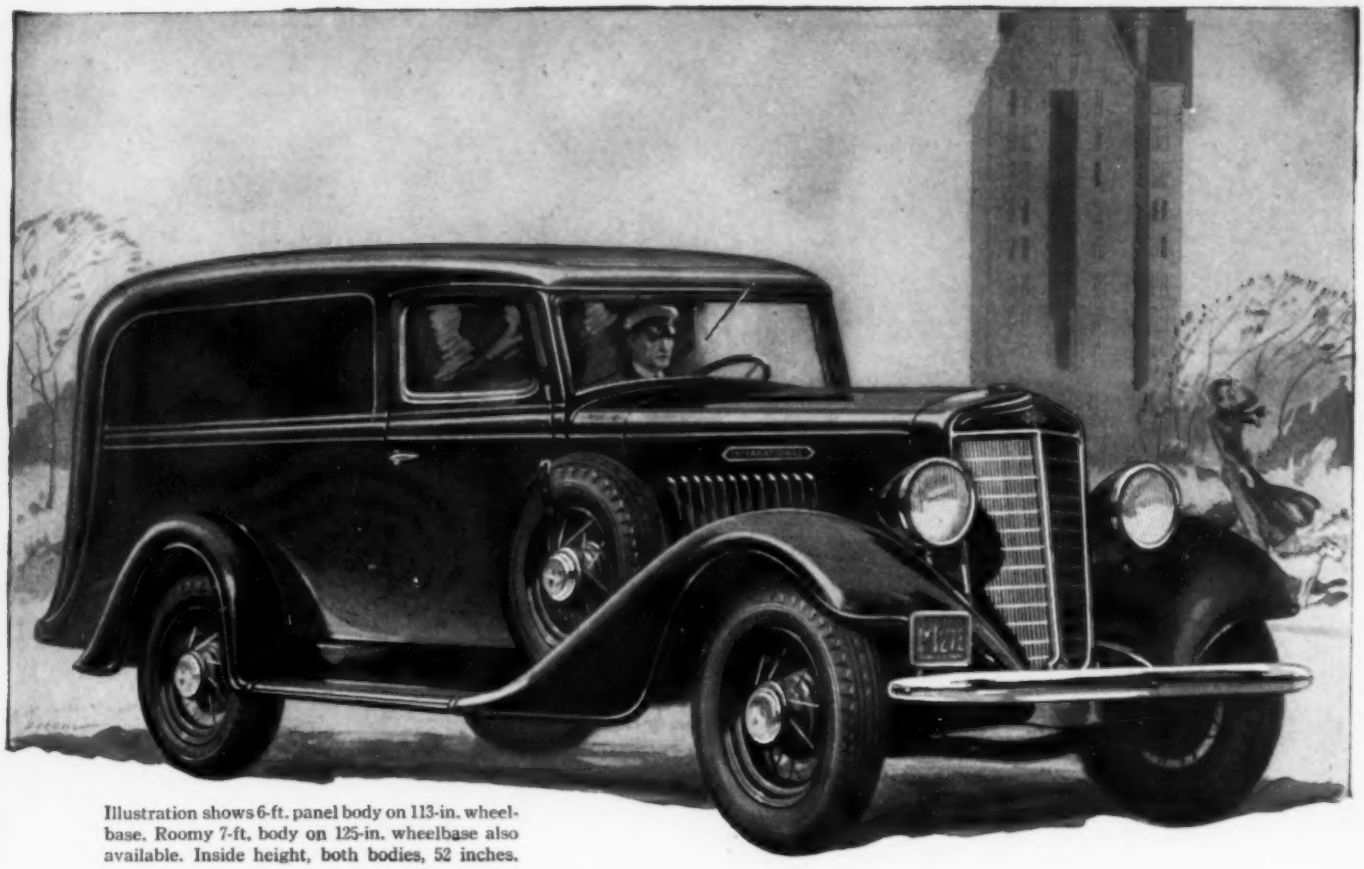


Illustration shows 6-ft. panel body on 113-in. wheelbase. Roomy 7-ft. body on 125-in. wheelbase also available. Inside height, both bodies, 52 inches.

INTERNATIONAL HARVESTER

Presents New ½-ton Truck

THIS new Half-Ton International, the Six-Cylinder Model C-1, is a truck of serviceable distinction and beauty, combining new qualities of utility, comfort, performance, and economy. You will find it an outstanding value in the low-price field.

The new Half-Ton International is a fast and sturdy unit that is *all truck*, with chassis and engine built for *truck* performance, like every International, and styled as you see it above. See and drive this latest product of International engineering, now on view at International Branch and Dealer showrooms.

INTERNATIONAL HARVESTER COMPANY
606 S. Michigan Ave. OF AMERICA (INCORPORATED) Chicago, Illinois

International Model C-1 truck with all-steel pick-up body 66 in. long, 47¼ in. wide. The truck is also available with canopy-top and station-wagon bodies. The complete International Truck line ranges from ½-ton to 7½-ton capacities.

Half-Ton Model C-1—Brief Specifications

Rated Capacity: ½-ton.
Wheelbases: 113 inches and 125 inches.
Engine: 6-cylinder, L-head type; bore, 3⅛ inches; stroke, 4½ inches. Maximum brake h. p., 78.5. Counterbalanced crankshaft. Removable-shell, precision-type main and connecting-rod bearings. Exhaust-valve seat inserts. Pressure lubrication. Down-draft carburetion. Air cleaner.
Clutch: 9-inch single-plate, with vibration damper.
Transmission: 3 speeds forward and 1 reverse.
Universal Joints: All-metal, roller-bearing type.
Rear Axle: Spiral-bevel. Chrome-molybdenum steel axle shafts.
Steering Gear: Irreversible cam-and-lever type.
Brakes: 4-wheel, mechanical, equal-action cam, 2-shoe type.
Chassis Lubrication: Hydraulic-type.
Springs: Semi-elliptic. All leaves of silico-manganese steel.
Tires: 5.25-18 (standard). Standard Equipment includes spare wire wheel, fender well tire carrier, front and rear fenders, full-length running boards. Airplane-type instrument panel.

INTERNATIONAL TRUCKS

Say "I saw it in FLEET OWNER"—It Helps!

When bison take to *their heels* it's a good thing to *take to yours* in the direction of a nice safe place. And yet your delivery trucks or commercial cars—uncontrolled by good brakes—could easily do as much damage in a few minutes as a herd of bison would ordinarily accomplish in a good many miles.

When you translate the stopping of a car into terms of what such an accomplishment actually represents, you'll appreciate why Thermoid F-M-L Brake Lining is specified by the responsible heads of so many leading companies operating commercial cars and trucks.

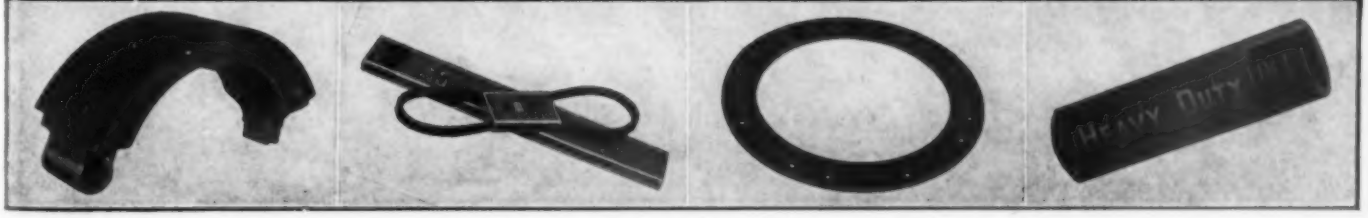
Thermoid gives immediate soft-pedal action and maintains it throughout life. Thermoid won't fade out . . won't grab in damp weather . . . won't score brake drums. One lining for all motor vehicles . . . road conditioned in the factory. When you *visualize* you *realize* that Thermoid is the lining for your drivers to *use* . . . the lining for *you to specify!*

NRA

Thermoid
BRAKE LINING

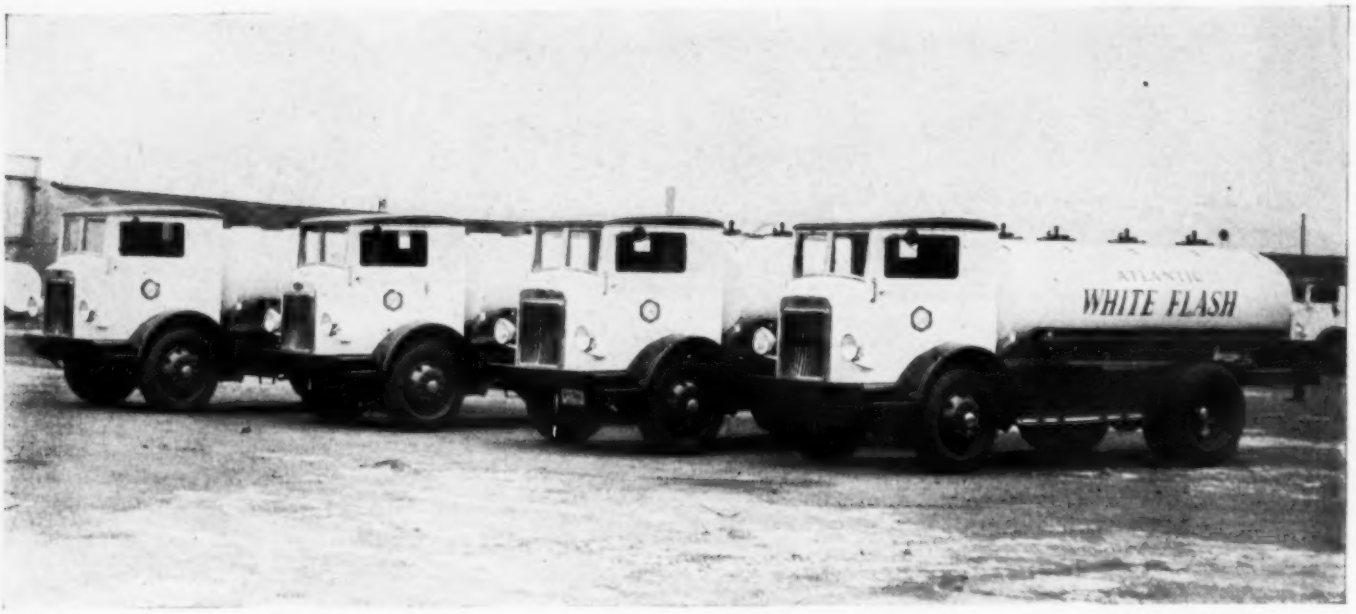
THERMOID RUBBER COMPANY
Department F
Factories and Main Offices: TRENTON, NEW JERSEY

HEAVY DUTY BRAKE BLOCKS | HEAVY DUTY FAN BELTS | HEAVY DUTY CLUTCH FACINGS | HEAVY DUTY RADIATOR HOSE



Say "I saw it in FLEET OWNER"—It Helps!

The Atlantic Refining Company uses DeVilbiss Equipment



The Atlantic Refining Company uses DeVilbiss Spray-Painting and Canopy Exhaust Equipment in spray-painting its fleet. New and modern DeVilbiss Spray-Painting Equipment produces better finishes than is possible with old-fashioned painting methods or old-style spray-painting equipment. The results are improved appearance, better protection. Also, by saving time in painting operations, and by faster releasing of trucks for duty, DeVilbiss Equipment helps you achieve lower maintenance cost.

It will be to your advantage to get in touch with your local DeVilbiss representative now. Or write us direct.

Spray-Painting and Exhaust Equipment—Air Compressors—Hose and Hose Connections—Oil Guns—Other Air-Using Equipment

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Say "I saw it in FLEET OWNER"—It Helps!

TRUCK TIRE COSTS DROP!

Goodrich Invention Saves Waste Caused by "Failure Zone" Blow-outs

THE FAILURE ZONE—where 80% of premature truck tire failures start—costs truck owners millions of dollars.

EVERY SIDEWALL BREAK STOPPED WHERE TRIPLE PROTECTION BEGAN
THIS HALF NEW CONSTRUCTION Triple Protected
THIS HALF ORDINARY CONSTRUCTION

Goodrich built special tires, half of each with ordinary construction, half with Triple Protection. Every tire was run until it failed. Every tire failed in the half made the ordinary way.

ROAD TESTS PROVE TRIPLE PROTECTION CHECKS 80% OF PREMATURE FAILURES

The commonest causes of premature truck tire failures have been sidewall breaks. That was the problem that faced truck owners . . . Until Goodrich startled tire users—and tire men everywhere—with Triple Protection against failures at that point. And Goodrich has *proved* the value of Triple Protection, not only in the laboratory, but on the road. Goodrich proved Triple Protection with tests that could not be faked!

Many tires were built, half of each tire with ordinary construction, half with Triple Protection. Mounted on heavily overloaded trucks, these tires were given the ride of their lives . . . Day after day over rough, bumpy roads . . . hundreds of miles . . . thousands. Then the first blowout!

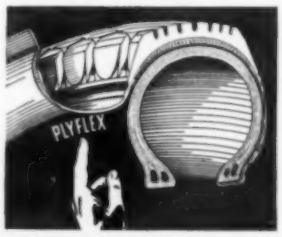
Every tire was run until it failed. Every tire failed in the sidewall. Every tire failed in the half made the ordinary way. Every break stopped where Triple Protection began.

Get Triple Protection Free

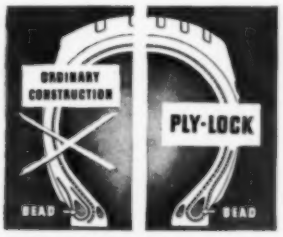
Now Goodrich offers Triple Protection at the "Failure Zone." This great invention costs you nothing. It is free. A Goodrich Triple Protected Silvertown costs no more than any standard truck tire.

And you do save money with this different kind of tire. You forget unnecessary sidewall failures—avoid delays and accidents. Cut repair bills. Save time.

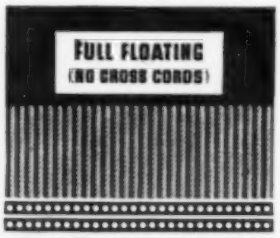
Read the simple 1-2-3 story of Triple Protection at the left. Ask any Goodrich truck tire dealer to show you this new tire and the convincing demonstration of Triple Protection.



1 PLYFLEX—is a *new* tough, sturdy rubber material. Every Silvertown truck tire has a layer of Plyflex protecting the sidewall. It bears the brunt of the strains caused by the tire flexing several hundred times a minute. It distributes the stresses throughout the carcass. It prevents local weakness.



2 PLY-LOCK—The short trouble-causing plies in ordinary tires often tear loose just above the bead. A direct result of stresses concentrating at this one weak point. In Silvertowns, the plies are "locked" about the beads—anchored in place. The tapered ply ends are floated in rubber. This is PLY-LOCK.

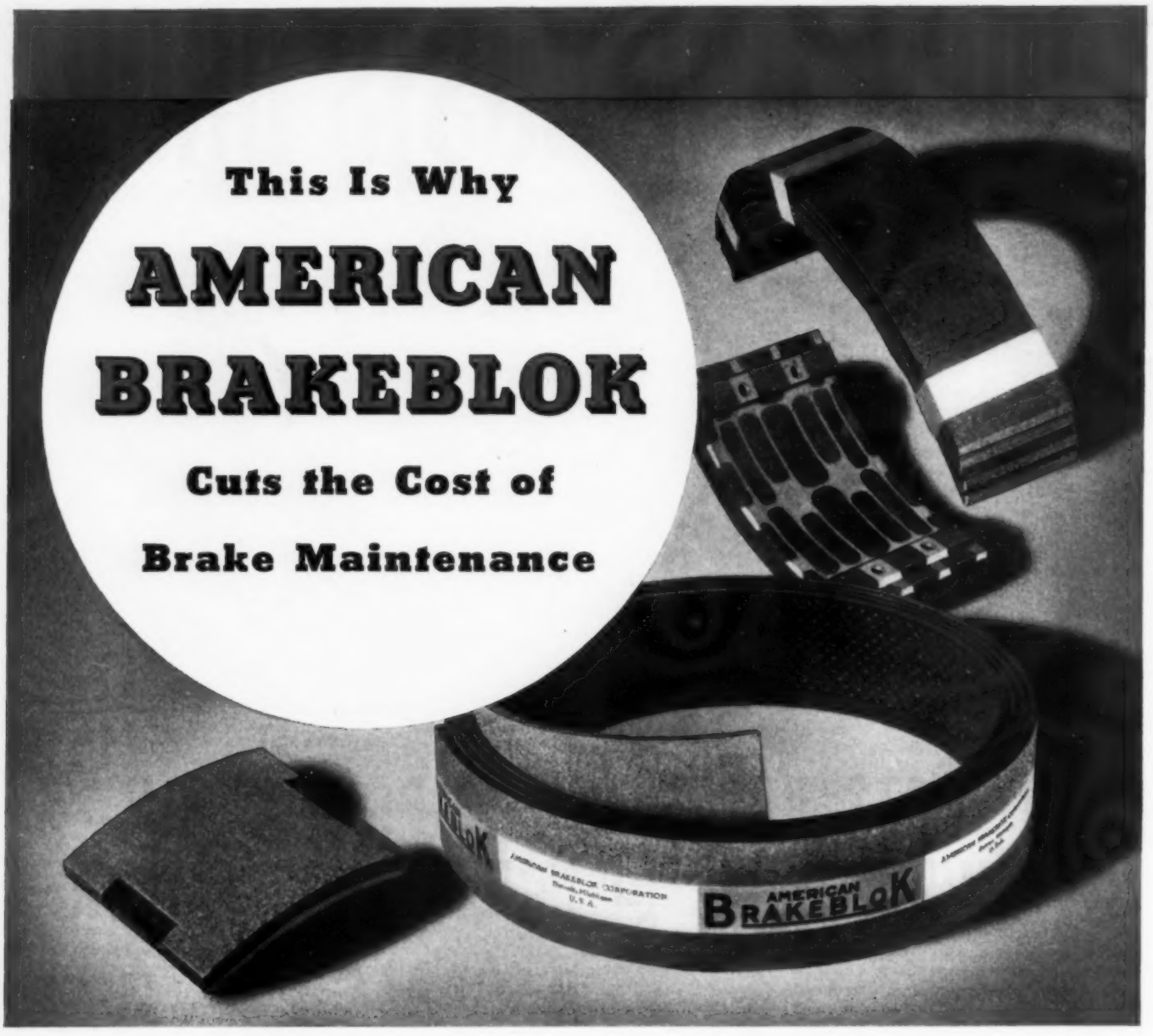


3 FULL-FLOATING CORD—100% floated-in-rubber cord fabric is used in the new Silvertowns . . . Each cord is surrounded by rubber. With ordinary cross-woven fabric, when the cords touch each other, they rub—get hot—break. In Silvertowns there are no cross cords. No friction . . . Fabric *wears longer.*

FREE! Safety Manual—This 48-page book tells how to prevent accidents—save money—build good will for your fleet . . . How to organize the Silvertown Safety Award Plan—get free awards for your drivers . . . The book will be sent without obligation to any fleet owner. Write Dept. T-90, The B. F. Goodrich Rubber Company, Akron, Ohio.

Goodrich *Triple Protected* Silvertowns
FOR TRUCKS AND BUSES

Say "I saw it in FLEET OWNER"—It Helps!



BRAKE maintenance expense is lower where fleet operators have standardized on AMERICAN *Brakeblok* for their trucks, buses, and passenger cars. There are definite reasons for this economy.

In the first place AMERICAN *Brakeblok* is made only in one grade—*the finest grade*—and it gives the same results at all times. It is a dense, homogeneous solid, thoroughly heat-treated, non-compressible in service and cannot swell.

The alloy-mesh or grid backing permits deeper counter-sinking, giving a greater thickness of usable material, greater security of anchorage and the most precise installations.

The material, being the same all the way through, wears evenly and gives uniform results throughout its long life. Braking clearances are maintained and adjustments are seldom required.

Neither age, weather nor braking heats and pressures affect the characteristics of AMERICAN *Brakeblok*. It does not burn out or break down under the most severe heavy-duty usage.

AMERICAN *Brakeblok* is available in all forms—Rolls, Full-Coverage Sets, Keeper-Type and Bolt-On Full-Coverage Type Brakebloks. We believe (and records of many of the largest fleet operators support us) that *any* operator can save money and operate his equipment with greater safety by standardizing on AMERICAN *Brakeblok*. Write direct to us for complete information on any type of installation in which you are interested.

Quick Facts About American Brakeblok

This new type of braking material is:

—a dense, homogeneous solid—the same clear through.
—formed under pressure—not woven or laminated.
—scientifically heat-treated.
—ground to absolute uniformity in thickness.
—resistant to highest braking heats.
—non-compressible under braking pressures—stays in adjustment longer, minimizing possibility of squeals.
—made with an alloy backing that gives greater thickness of usable material—longer life—and better installations.

AMERICAN BRAKEBLOK
Reg. U.S. Pat. Off.

AMERICAN BRAKEBLOK CORPORATION • 4660 MERRITT AVENUE • DETROIT, MICHIGAN, U. S. A.
New York, Cleveland, Chicago, St. Louis, Los Angeles, San Francisco
A Division of **American Brake Shoe and Foundry Company**

VOL. 12
NO. 5

The FLEET OWNER

MAY
1934

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

Breathes there a man with soul so dead,
Who never unto himself hath said,
When on a bolt, he stripped the thread:
[illegible]

PAGE MR. AVERAGE USER

● The article on page 22 of this issue comes from a fleet operator who believes he is "Mr. Average 1½-ton Truck User." In his offering he mentions a few of the things he would like to see incorporated in the "average" 1½-ton truck. Apparently his opinion of the truck manufacturers, though not caustic, is uncomplimentary. We're sorry that we can't agree with him, even if we did publish his article. Truck manufacturers (and we mean all of them) deserve a lot of credit for their engineering foresight. The fact that they have developed such excellent models that really do appeal to and can satisfy the average 1½-ton user is something to write home about. After all is said and done, there is no such thing as the "average" 1½-ton user. Nothing in this business of ours can be called average. It's full of complexities and very few operations can even be compared to each other. We feel sure that every truck manufacturer is just "dying" to meet Mr. Average User. Come out from your hiding place, Mr. Groundhog. Mr. Ripley (and the truck makers) will be pleased to meet you.

●

RIGHT-ABOUT FACE?

● This is a poor time to be talking about the correct way of warming-up cold engines but it's hard to resist the temptation since our attention has been called to an article which tells us that the old idea of a slow warm-up is "all wet" both physically and metaphorically. To be brief, it's in *The Vauxhall Motorist*, a British publication. Their March issue contains an article which tends to prove that "scientific research" shows the old idea—warm up slowly—to be wrong. Stiffness in a cold engine, they tell us, is due to the *presence* of oil on the cylinder walls and bearings— *not* the *absence* of it. To idle the cold motor slowly only delays the addition of fresh oil to it and causes a deposit of water on the cold cylinder walls—one of the products of combustion. They would have us believe that the "wear" which occurs when starting up a cold engine is not *mechanical* abrasion but a *chemical* corrosive action, which sounds reasonable, at that. Maybe the boys who like to hear the roar of a cold engine on a frosty morning are not such meanies, after all. But far be it from us to influence them either way. It seems possible for these champion accelerator depressors to overdo our British contemporary's recommendation and drive their vehicles "full-out" (as they say in England) right off the bat. However, their tests revealed that good results were obtained by warming-up at about 1800 r. p. m. at about half-load, which corresponds to a road speed of about 30 m. p. h. They state that this ought to be a good procedure for most engines. What do you think?

●

GEAR RATIOS, AGAIN

● Our old friend, Mr. Gear Ratio, has popped up again. This time in the form of a nice, shiny salesman's coupe. A man who claims he has "nothing to sell" writes at length to inform us that those who lay out the gear ratios for today's passenger cars are but compromisers at best. We've always believed that the car demanded by John Q. Public differs in many respects from the car that you would like your salesmen to drive, particularly in operating economy. This man proves it with facts and figures. Since they were arrived at by experimentation with a fleet in Cincinnati, we feel that it's worthy of publication. So you'll find his suggestions on page 24 of this issue. Remember, he has nothing to sell, so there's nothing to lose; but if you are skeptical, keep your hands in your pockets while you read it and you won't go wrong.

●

THE LAST WIND-UP

● Or should we say "round-up"? We are referring to L. V. Newton's article, "*Passenger Cars for Commercial Use*" appearing on page 20. It's quite a coincidence that this, the last of Mr. Newton's installments, comes to you in the same issue as the article mentioned in the preceding paragraph. After reading both of these works, all of us ought to have a better idea as to what we want *our* passenger cars to be. Here's hoping that we get what we want. And don't let us forget that rising vote of thanks for Mr. Newton.

●

MAKE YOUR OWN COMMENT

● A bill, introduced in a recent special session of the Washington legislature, was designed to provide for exempting State Senators and Representatives from payment of the State's 5c per gallon tax on gasoline. The measure was defeated. Apparently legislators enjoy high taxes on gasoline as much as you and I do.

●

H. Clay Fischer
Editor

●

Operating and Maintaining a Bakery Fleet

By Morris Cohen,
Industrial Engineer, Schulze Baking Company, Kansas City, Mo.

Part I • Outlining the General Characteristics of This Type of Service; Though Decentralized at Nine Plants It's Well Maintained

IN discussing bakery fleet operation, I will try to tell you something of what we try to do and some of the things that we accomplish in our own fleet. In talking about our own fleet I hope I don't convey the notion that everything we do is perfect. We do things to the best of our ability and always hope to improve.

There are three definite goals at which we aim in operating a fleet of trucks: (1) to keep the equipment in good mechanical condition; (2) to keep it in good appearance; and (3) to obtain as low an operating cost as possible. The importance in which we consider these aims are in the order in which they are listed.

Good mechanical condition we must have in order to give good uninterrupted delivery service. We handle food products; bread, cakes, etc., in which time is a very important element. An hour or two of loss in the delivery schedule may mean the complete loss of a sale. Also, good mechanical condition of equipment is definitely related to low operating cost. So we place that as first of our objectives in fleet operation.

Next in importance comes appearance. It is good business to have the trucks looking good. It is one of the inexpensive ways of advertising, and it has a good effect on the morale of the salesmen who drive the trucks.

Our fleet consists chiefly of ½-ton to 1½-ton panel body trucks. Before going further, it might be well to say a few words about the type and size of bodies that we are using. Panel bodies, either independent of the cab, or designed to include the cab are used for bread delivery. These bodies are generally 96" long, 54" wide, and 50" high, inside dimensions. For cake delivery, standard ½-ton panel trucks are used.

The tendency in the baking industry is towards the use of truck manufacturers' bodies rather than custom-built bodies. While the truck manufacturers' bodies do not have the few little things that the bakery fleet operator would like to have, on the other hand, their appearance is better and the initial cost of the truck manufacturers' bodies is less than those of the custom-built type.

At present I would say that the majority of bakery trucks have custom-built bodies. The custom-built body costs more than the truck manufacturers' body, but it is a general practice that custom-built bodies are used for two or three chasses. That, of course, cuts down the cost of the body per truck. In the last three or four years the truck manufacturers have standardized on chassis dimensions, and that makes custom body transfers that much easier.

In building a custom-built body the user can put ideas of his own into the body, such as special insulation, side doors, special sealing schemes for making the body airtight, etc. The item of overall length of the truck is a factor. The standard length of 1½-ton truck factory panel bodies is 108". Some bakers prefer a shorter body, but wider to give them the required space, because of crowded condition in the loading shed or garage.

As mentioned before, the two advantages that I can see at present that the truck manufacturer's body has over the custom-built body are appearance and low initial cost.

One interesting item that is discussed from time to time is the weight of the body. The weight of custom-built bodies for 1½-ton bread trucks used to be between 1700 and 2000 pounds. In the last few years we have reduced this range to from 1000 to 1400 pounds. I thought we might be able to notice the effect of reduced weight in the gasoline consumption. However, it seems there are so many other factors involved that we have not yet been able to see any appreciable difference between the trucks that have light bodies and those that have heavy bodies.

Of course, we go on the assumption that the lighter bodies should result in lower operating costs, and therefore we should buy the lighter bodies. The amount of weight reduction in the body, how-

(*Please turn to page* 16)

SALESMAN'S DAILY REPORT ON AUTOMOBILE

Truck No. _____ Route No. _____ Date _____ 19___

This car needs attention as checked below:

Item No.	Trouble With	√	Nature of Trouble
1	Battery		
2	Body, Top, etc.		
3	Brakes		
4	Carburetor		
5	Clutch		
6	Differential		
7	Engine		
8	Fan		
9	Fenders		
10	Generator		
11	Ignition System		
12	Lights		
13	Radiator & Pump		
14	Speedometer		
15	Springs		
16	Steering		
17	Tires		
18	Transmission		
19			
20			
21			
22			

Purchased on Route

_____ $

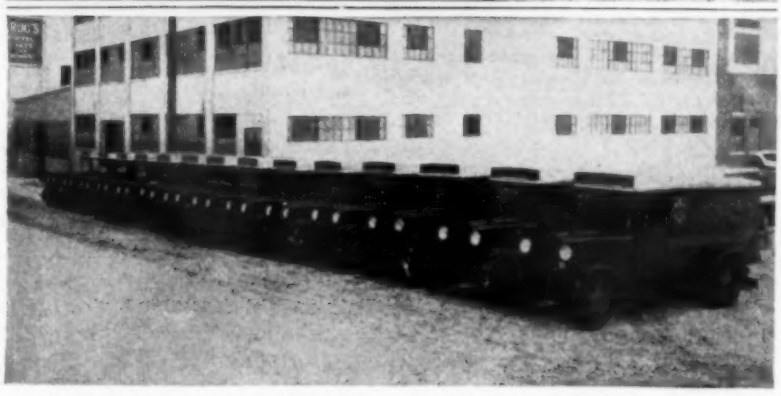
_____ Gals. Gas $ _____

_____ Qts. Oil $ _____

This Daily Truck Card is filled in by each driver-salesman when he returns from his route. If nothing is wrong with the vehicle it must be filed, anyway. The reverse side of it is shown on the following page.

"Voltage-Control"

A NEW WEAPON AIDS FLEET OWNERS TO REDUCE MAINTENANCE COSTS



● *All kinds of fleets are reducing maintenance costs with Bosch Volt-O-matic Generators. For example:*

TOP: Mundus Brewery truck fleet, Detroit, Michigan.
CENTER: Fleet of the Police Department, City of Chicago.
BOTTOM: Fleet of Krug's Bakery, Jamaica, New York.

THE maintenance department of one large truck fleet had to recharge the batteries of every truck every week. Two months ago the trucks were equipped with Bosch Volt-O-matic Generators. *Not a single battery has needed recharging since.*

The police department of a large city had to recharge the batteries on its police radio cars every day. Since Bosch Volt-O-matic Generators were installed nearly a year ago, not one battery has required recharging.

These results are not exceptional but are typical of the way Bosch Volt-O-matic Generators protect batteries against overcharging or insufficient charging. *The automatic voltage control* ends the delay and expense of road breakdowns caused by hitherto unavoidable battery abuses.

Bakers, brewers, oil companies, coal companies, chain and department stores — literally thousands of fleets of all kinds are standardizing on Bosch Volt-O-matic Generators. They have found them to be the only answer for fleet operations, especially those requiring long night driving, frequent starting and stopping, etc. There is a type for every purpose from 60 to 1000 watt capacity.

Mail coupon today for our new booklet "Out of the Furnace Comes a Simple Explanation of the Bosch Volt-O-matic Generator", which describes what Bosch Generators can do for you.

The makers of Bosch and American-Bosch products for years have taken pride in creating, designing, building and selling only products that are superior to those commonly in use. Proven leaders in their field they are built up to a high standard of quality and not down to a price.

UNITED AMERICAN BOSCH CORPORATION, SPRINGFIELD, MASS. SEND BOOKLET ON SUBJECTS CHECKED:

PRODUCTS manufactured by ROBERT BOSCH A. G., bear trademark shown above. Sold by United American Bosch Corporation.

PRODUCTS OF ROBERT BOSCH A. G.

- ☐ Bosch Volt-O-matic Generators
- ☐ Bosch Ditch & Fog Light
- ☐ Bosch Neverstall Windshield Wipers
- ☐ Bosch Vibro-Balanced Horns
- ☐ Bosch Rapid Transit Magnetos

PRODUCTS OF UNITED AMERICAN BOSCH CORPORATION

- American-Bosch Big Brute Coil ☐
- American-Bosch Condensers ☐
- American-Bosch Battery Charger ☐
- American-Bosch Magnetos ☐
- American-Bosch Car-Radio (25) ☐
- Pyro-Action Spark Plugs ☐

PRODUCTS manufactured by the UNITED AMERICAN BOSCH CORP., bear the trademark shown above.

WRITE NAME AND ADDRESS IN SPACE BELOW

Say "I saw it in FLEET OWNER"—It Helps!

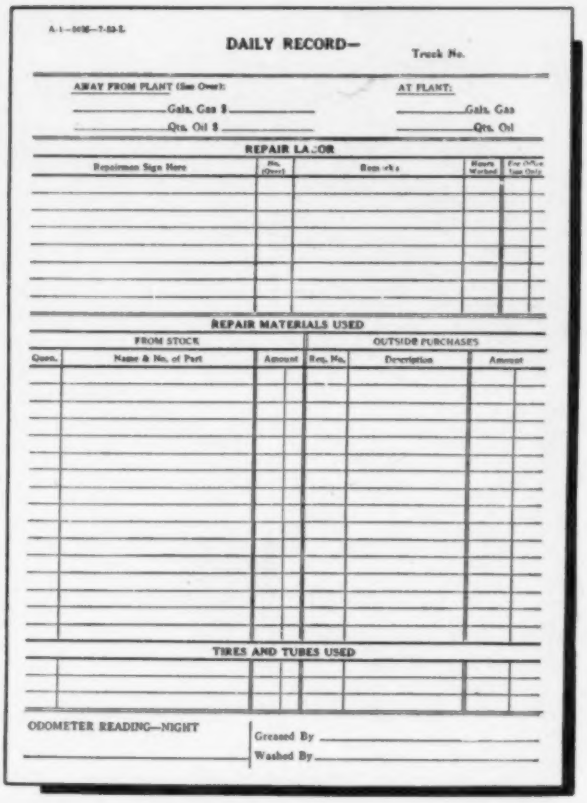
A "HOW-WE-DO-IT" ARTICLE (*Continued*)

ever, is not enough to enable the operator to switch from one size unit to one that is smaller. The half-ton unit is used for cake operations and a few city bread operations. The 1½-ton unit is used for nearly all of the bread routes, with a few exceptions where larger units are needed. Of course, the half-ton unit costs less to operate than the 1½-ton, but not enough weight can be taken out of a bread body to enable us to use a half-ton where otherwise we might have to use a 1½ ton.

Now that we've told you something about the size and type of our fleet, let us next discuss its operation and maintenance routine. These trucks go out every day, except Sunday, and average about 50 miles a day, the shortest routes being about 10 miles and the longest about 200 miles per day. In a day's run the trucks will average about 70 stops. These trucks are operated in 9 plants, the size of the fleet at each plant varying from 25 to 175 trucks.

The trucks leave the plant usually between 3 and 6 in the morning and return between 2 and 6 in the afternoon. To take care of any unusual condition, each plant has a number of spare trucks. The number of spares generally amounts to about 8% of the fleet.

The maintenance crew in each garage is organized to handle the usual adjustment and repair work. These crews are not large enough or properly equipped to do major overhauling. If a major overhaul job is necessary, it generally means the purchase of a new truck. Also, some types of minor repair work, such as radiator repair, generator work, battery repair, some types of body repair and painting, etc., are not handled by the garage crew but are sent out to firms who specialize in that work.



DAILY RECORD— Truck No.

AWAY FROM PLANT (See Over): Gals. Gas $ ____ Qts. Oil $ ____

AT PLANT: Gals. Gas ____ Qts. Oil ____

REPAIR LABOR

Repairman Sign Here	No. (Over)	Remarks	Hours Worked	Per Cent Time Only

REPAIR MATERIALS USED

FROM STOCK			OUTSIDE PURCHASES		
Quan.	Name & No. of Part	Amount	Req. No.	Description	Amount

TIRES AND TUBES USED

ODOMETER READING—NIGHT

Greased By ____

Washed By ____

Reverse side of Daily Truck Card shown on preceding page. This side is filled in by the mechanics, greasers and washers. In this manner, each truck carries its own expenses for each day on this double-purpose form. The two-in-one idea is very good.

To get a little better idea how some of these garages operate, let us consider a typical medium sized unit. This unit, let's say, has sixty trucks. Such a unit would have a foreman, 2 mechanics, a greaser and a car washer. The foreman's and the mechanics' time is so arranged that there is a mechanic at the garage at nearly every hour of the day and night. We want our mechanics at the garage in the daytime to take care of any road calls in the morning. In the afternoon, when the trucks are beginning to come in, there is plenty of work on minor repairs and adjustments to keep the mechanics busy. Also, in the afternoon the mechanics buy the necessary parts to keep the night man working.

Most of the periodic inspection and adjustment is done in the morning. Most of the trucks are in the garage between three in the afternoon and three in the morning, and that is a good time to make repairs and adjustments, in order not to tie up any more equipment than necessary. Also, we like to have a mechanic at the garage after 3.00 a.m. to see that there is no trouble in starting and to take care of any possible early morning road calls. The time of the three mechanics in this unit is stretched over practically the whole 24 hours of the day. This was easy to do before NRA came in with a 44-hour week.

We do not carry a stock of parts outside of some small items like spark plugs, gaskets, wire, etc., as the foreman generally gets all the parts necessary for that night's work before six o'clock in the evening. Sometimes he gets more parts than he needs, to make sure that he doesn't get stuck, and in that case, of course, he returns them the following day.

The car greaser comes in about one o'clock in the

(*Please turn to page* 53)

Two types of vehicles are used by the Schulze Baking Company's fleet, typical of which are shown in the pictures above. The one at the left is a ½-tonner for cake, while the one at the right is a 1½-tonner for bread. We don't have to tell you the make, do we? The bodies, in these particular units, are custom-built jobs, about which many details are related in the accompanying article.—Editor.

By Installing...

Pedrick

HEAT SHAPED PISTON RINGS!

Constant laboratory testing and designing has developed in the Pedrick line a ring for every engine need. Pedrick engineers publish a technical service showing in simple, understandable style how to select the correct ring for every engine condition. Now, with absolute assurance, oil loss can be corrected. It need no longer be an important factor in maintenance expense. Send us the coupon today.

THE COMPLETE PISTON RING LINE

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Wilkening Manufacturing Co.
2000 S. 71st Street
Philadelphia, Pennsylvania

Please send me complete information regarding PEDRICK'S Technical Service for fleet operators.

Name .....

Position .....

Address .....

City ..... *State* .....

FO

NRA

Wilkening Manufacturing Co.
Philadelphia

Preventive Maintenance Proves Itself

By F. C. Fiechter,
Fleet Manager, John Wanamaker, Inc., Philadelphia, Pa.

Some of the Things We Found After Dismantling a Truck That Had Been Operated Over One Hundred Thousand Miles

AS mentioned in the last issue of this publication, we recently dismantled one of our trucks (a popular make) which had been operated in excess of one hundred thousand miles (105,339 miles, to be exact) for the purpose of ascertaining the amount of wear in all working parts, and also in order to make a general check-up on all units.

The principal object of this thorough inspection was to determine, if possible, the merits of the preventive maintenance system under which these trucks are operated, the results of using reclaimed oil in motors, the effectiveness of our scheduled chassis lubrication and the many special features which we applied shortly after they were placed into service, as well as the merits of our own rust-proofing process, described in detail in the last issue.

Believing that other fleet operators will find our experience of interest, we are presenting the following report covering the condition of the motor and other units, including the hydraulic brake system and the chassis frame itself. Here is what we found and some of the things we did, to place this vehicle back into service:

JOHN WANAMAKER

CAR INSPECTION REPORT

TRUCK No. 617 MAKE TYPE Pkg. LOCATION 23rd L.F.

Speedometer Reading 105,339	Inspected Gill by Sebring 2-15-34	Work done by
Previous Reading	Previous Inspection	
Miles since last inspection	Repair Order No. Completed	

MOTOR P.A.S. Idle 210 RPM - 12.9
H.S. 2000 RPM - 11.8
Vacuum 17½ In.
Tighten Engine leg bolts
Timing gear cover leaking oil
Cylinders passing oil

COMPRESSION | 1 | 2 | 3 | 4 | 5 | 6 |
82 72 73 77 72 72

CLUTCH

TRANSMISSION gears - poor
excessive play in bearings

DRIVE SHAFT

DIFFERENTIAL Grease leak at pinion bearing

BRAKES L.F.P. 2/3 to go, L.F.R. new, R.F.P. R.F.R.2/3 to go,L.R.F. 2/3 to go,L.R.R. ½ to go, R.R.F. and R.R.R. 2/3 to go
Emergency brake, low point screw stripped

STEERING COLUMN wheel play 2"-adjust to 1½"

SHORT STEERING ROD Adjust link at drop arm

FRONT AXLE Excessive play in spindles

COOLING SYSTEM
Radiator
Pump
Water connections
Fan
Fan belt

FUEL SYSTEM
Carburetor Clean
Vacuum tank
Gasoline tank
Gasoline lines
Sediment cup clean
Intake manifold

EXHAUST SYSTEM
Muffler Exhaust pipe loose at front end
Exhaust pipe
Exhaust manifold

ENGINE OIL SYSTEM
Oil pressure Idle 25 lbs. H.S. 55 lbs.
Oil filter clean
Oil lines
Oil tanks

STARTING AND LIGHTING SYSTEM
Battery Clean / refill, clean terms, suppl. missing clamp, check water
Starting motor
Generator Max. charging rate 21 Amps.
Horn
Chassis lights Repair tail, clean head lam
Body lights reflectors, repair foot lam tubing.
Ammeter
IGNITION SYSTEM Clean & adjust breaker Spark-Quarter
Spark plugs replace
Wiring

WHEELS AND TIRES R.F. wheel rim lug out of line

SPRINGS Tighten front clips

FRAME AND FITTINGS

HOOD Rest Left rear corner

CAB Windshield right bottom thumb screw broken

SEAT

BODY

MISCELLANEOUS
Speedometer
Crank handle
Shock absorbers
Mirror
Windshield wiper
Tools
License tags T 650 A
License cards

PAINT peeling - both sides
lower panels

TRIMMING

LUBRICATION Red - O.K. throughout

CLEANLINESS
Body
Chassis

WORK COMPLETED

Before dismantling—Here is what our Inspection Report revealed after operating a truck 105,339 miles under our regular preventive maintenance system.

Condition of Motor: When the oil-pan was dropped, we noticed a considerable amount of soft carbon and sludge on the crank-case oil screen. There was a trace of water in cylinder number four. We tested the block with 100 lbs. of air pressure and found it o.k. However, the cylinder head was slightly scored, caused by a broken valve-spring keeper, allowing number four exhaust valve to come into contact with the cylinder head.

The following cylinder block measurements were noted: Number 1, .012" tapered; Number 2, .010" tapered; Number 3, .010" tapered, .003" out-of-round; Number 4, .011" tapered; Number 5, .013" tapered; Number 6, .015" tapered, .003" out-of-round.

Pistons were worn in top ring grooves and tapered at the lower end of the skirts. Piston pins were also worn. The following piston wear was observed:

Piston Wear	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Tapered	.004"	.006"	.004"	.004"	.004"	.004"
Out-of-round .	.006"	.004"	.004"	.004"	.004"	.004"
At top groove	.015"	.016"	.016"	.010"	.012"	.016"

The intake and exhaust valves were also somewhat worn, and all of the exhaust seats were cracked. The valve guides were worn approximately .003" each and were replaced. The valve springs were all lacking in tension and were replaced. Valve lifters were .001" tapered and the valve tappets were worn. The last mentioned were replaced. Here are the tapered measurements found on the valves:

Valve Taper	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Intake Valve .	.004"	.002"	.002"	.000"	.003"	.004"
Exhaust Valve	.004"	.003"	.002"	.006"	.003"	.004"

The crankshaft and connecting-rod bearings were worn from .001" to .003". On number four rod bearing, part of the babbitt was broken out of the upper half of the bearing; number two and number six also had cracks in the upper half of connecting-rod bearings, but not serious. Main bearings were "in good condition." The following are the measurements of the crankshaft:

Main Journal Wear	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
(Undersize) . .	.001"	.002"	.003"	.001"	.003"	.003"	.001"
Crankpin Wear	**No. 1**	**No. 2**	**No. 3**	**No. 4**	**No. 5**	**No. 6**	
(Undersize) . .	.001"	.001"	.001"	.001"	.001"	.001"	

The timing chain was found to be stretched to the extent of ⅜" but it was not advisable to replace this as yet.

Reconditioning of Motor: It was decided to rebore the cylinders to .031" oversize and fit them with strut-type, aluminum-alloy, split-skirt pistons, with new

Match this 1½ Ton FEDERAL

At this New Low Price of $645

STANDARD CHASSIS AT FACTORY—DUAL TIRES EXTRA

A COMPLETE LINE OF FEDERAL QUALITY TRUCKS PROPORTIONATELY LOW PRICED—4 AND 6 WHEELERS—UP TO 7½ TONS.

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- ✓ 10,000 lbs. Maximum Gross
- ✓ Attractive Appearance
- ✓ Modern Instrument Panel
- ✓ Stylish Sloping V-type Radiator
- ✓ 8½" Fish Belly Frame
- ✓ 6 Cylinder Truck Engine
- ✓ 228 Cubic Inch Displacement
- ✓ Full Power at Low Engine Speed
- ✓ 7 Bearing 2½" Crankshaft
- ✓ Full Pressure Lubrication
- ✓ Valve Seat Inserts
- ✓ Positive Gear Driven Water Pump
- ✓ 10 Inch Truck Clutch
- ✓ 4 Speed Transmission
- ✓ Roller Bearing Universal Joints
- ✓ Heavy Full Floating Rear Axle
- ✓ Large Hydraulic Brakes 250 Sq. In. Effective Brake Area
- ✓ Front Springs 38" Long x 2½" Wide. Rear Springs 50" Long x 2½" Wide
- ✓ Rubber Bushed Spring Eyes Need No Lubrication
- ✓ Standard Tire Equipment 6.00/20 6 Ply Front—32 x 6 8 Ply Rear
- ✓ Chassis Insulated with 157 Pieces of Rubber
- ✓ Wide Range of Wheelbase Lengths
- ✓ Quality ALL TRUCK Construction

FEDERAL MOTOR TRUCK COMPANY
DETROIT, MICHIGAN
CANADIAN FACTORY—WINDSOR, ONT.

TODAY'S GREATEST VALUE IN A
• • LOW-PRICED TRUCK • •

WHAT WE FOUND AFTER 105,339 MILES *(Continued)*

piston pins, of course. New connecting-rod bearings were furnished and finish-reamed. All rods were aligned and number four was replaced. Piston rings, of course, were also hand-fitted to each cylinder in the usual way.

Steel and cast-iron valve inserts were installed in the exhaust valve seats, three of each kind being used; one each in alternate cylinders and stencilled properly for identification later on, so that observation can be made of their respective performances in service. The valves were refaced and new springs and guides installed.

When replacing the old timing chain, a new idler gear—from a later model of the same engine—was used. Wear in bore of gear was .001"; eccentric take-up wear .004".

The carburetor and vacuum tank were cleaned out; a broken elbow on the air cleaner was replaced. New distributor points were installed and adjusted. New spark plugs were installed. Balance of electrical system units were given the usual attention.

The entire cooling system was cleaned. Water-pump was repaired with new bushings, using the old shaft. The radiator was found to be in good condition and just flushed out. The water-jacket cover-plate was cleaned and cadmium-plated before re-installing.

Transmission; Clutch; Rear-End; Frame: The second-speed gear on the countershaft in the transmission was found to be considerably worn, with the leads of the teeth chipped. This was replaced with a new one. The bearings were found in a satisfactory condition. Clutch throw-out bearing was replaced. The pilot bearing, found broken, was also replaced. The clutch spring was lacking in tension to the extent of ⅜" forward travel; this, too, was replaced. The clutch facing was in good condition. Emergency brake on drive-shaft was relined. The drive-shaft was re-installed, with all new cork gaskets. Re-inforcing band was installed on rings and electrically spot-welded.

In the rear axle assembly, the gears were found in a satisfactory condition. However, the bearing on the left side of the differential housing was loose and the right one was defective. The left bearing was adjusted and a new race fitted on the right side. No other adjustments were made, as the ring gear and pinion were in good condition, rivets tight and pinion meshing properly. Axle shafts and wheel bearings were satisfactory. All grease retainers on both front and rear wheels were renewed.

Front axles were replaced with rebuilt units having oversized lower bushings. Spindle pivots were reground .012" undersize. Steering column and gear were in good condition.

Fenders and headlamps were in good condition. However, it was necessary to replace a broken cable on one headlight; also on the tail-light. The right and left splash aprons were painted, before re-installation, with a special water-resisting paint on their under-sides. The right upper end of the gas tank was damaged considerably, caused by a loose battery support or short circuit. In time, this would wear through tank, if neglected, causing further damage. Frame and spring hanger rivets were all tight. Cowl and windshield were also in good condition.

Springs and Shackles: The springs were found in good condition; however, all bushings were worn, but not enough to be replaced, with the exception of the right front bushing, which was worn **through,** and replaced with a new one. Spacing washers were used on springs. The right front spring bolt, which had .045" wear, was also replaced. The balance of the spring bolts showed wear; some as low as .003" and one as high as .023". All of them were re-installed, after cadmium-plating. All other bolts and nuts were also cadmium-plated before installation.

Hydraulic Brake System: In the brake system, three rubber hoses were replaced. The left side of the tubing was found broken; caused by broken cross-chains of the tire chains. This was replaced with a new one. The master cylinder was reconditioned and cadmium-plated. Wheel cylinders were found in good condition, and re-installed, with new rubber cups and boots.

Front and rear brake-shoes were relined with new lining. Special ½" graphite discs were installed at the heels of the front shoes, and placed onto the lining with shellac. Rear shoes were also treated with special ½" round graphite sticks, with tension on drums at all times. This graphite treatment is for experimental purposes.

The condition of the front and rear brake drums was found satisfactory, with the exception of a slight rib on the outer edge of the drums. This was machined out, giving true braking surface.

(Please turn to page 53)

JOHN WANAMAKER — Final Inspection

CAR INSPECTION REPORT

TRUCK No. 617 MAKE TYPE Pk. LOCATION 23rd St. P

Speedometer Reading 105,363	Inspected by Sull 3/1/34	Work done by
Previous Reading	Previous Inspection	
Miles since last inspection	Repair Order No. Completed	

MOTOR
Fuel-air ratio 14½ 380 RPM 12.8
2,0,8000 RPM 14.1
Vacuum 17½ In.
Water temperature 176° Air. Temp. 67°

COMPRESSION 1 75 | 2 75 | 3 75 | 4 75 | 5 75 | 6 75

CLUTCH OK

TRANSMISSION OK

DRIVE SHAFT OK

DIFFERENTIAL OK

BRAKES Tested - 17 Ft. -Service Brake and 30 Ft. Hand Brake at 20 M.P.H. (Slight squeak in rear wheel brakes

STEERING COLUMN Wheel play adjusted to 2 1/4"

SHORT STEERING RODS

FRONT AXLE Toe-In adjusted to 1/32"

COOLING SYSTEM
Radiator OK
Pump OK
Water connections OK
Fan OK
Fan belt OK

FUEL SYSTEM
Carburetor OK
Vacuum tank OK
Gasoline tank OK
Gasoline lines OK
Sediment cup OK
Intake manifold OK

EXHAUST SYSTEM
Muffler OK
Exhaust pipe OK
Exhaust manifold OK

ENGINE OIL SYSTEM
Oil pressure 3#8 14½ 10 lbs. R.P. 40 lbs.
Oil filter OK
Oil lines OK
Oil tanks

STARTING AND LIGHTING SYSTEM
Battery OK
Starting motor OK
Generator Charging rate 10 Amps. OK
Horn OK
Chassis lights Adjusted to 25' on High Beam OK Head Lamp
Body lights OK
Ammeter OK

IGNITION SYSTEM Spark-O-Meter 120
Spark plugs OK
Wiring OK

WHEELS AND TIRES OK

SPRINGS OK

FRAME AND FITTINGS OK

HOOD OK
CAB
SEAT OK
BODY OK

MISCELLANEOUS OK
Speedometer OK
Crank handle
Shock absorbers OK
Mirror
Windshield wiper Adjusted
Tools OK
License tags OK
License cards OK

PAINT OK

TRIMMING OK

LUBRICATION OK

CLEANLINESS
Body OK
Chassis OK

WORK COMPLETED

After reconditioning—Here is what our Inspection Report showed after reconditioning the truck that was operated 105,339 miles without major overhauls. From the mileage shown, the test run amounted to 24 miles.

By L. V. Newton,

Byllesby Engineering & Management Corp., Chicago, Ill.

Effecting Economies *in the* Fleet

Article VIII • Passenger Cars for Commercial Fleet Users • What the Average Fleet Operator Wants in So-Called "Standard" Jobs

THE fleet owner, in making his purchases of passenger cars, must of necessity accept the current offerings of the car manufacturers. He does not have the same opportunity of injecting his ideas into the design of these vehicles, that he has in the purchase of his trucks and busses. In other words, he must select the particular car that appears best suited for his requirements and fit it into his operation the best he can.

I recognize, of course, that there is an excellent reason why this is so; namely, that the car manufacturer is building cars to suit the masses and not for any particular group or industry. I further realize that the low cost of cars today is due to quantity production and that our vehicles would cost a great deal more, were it not for quantity-buying on the part of the public.

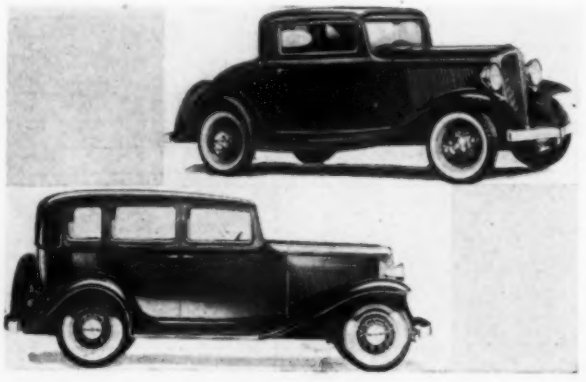
The car manufacturers during recent years have been called upon to exercise the greatest ingenuity in creating a buying demand on the part of the public. The skill and promptness with which they could bring out new models that through their performance, styling and appearance outmoded the old models determined largely their success.

Standardization in passenger cars on the part of the fleet owner, under the above mentioned conditions, however, means standardization in name only, as the interchangeability of parts between models is slight. This possibly is one of the penalties that we must pay for progress in the cost—the manufacturers would greatly help the fleet owner if greater interchangeability of parts were offered.

We want as simple a vehicle as possible and one that will be free from gadgets and automatic devices that invariably increase maintenance expense.

Within the past few years, various manufacturers have offered "standard" models on which certain devices, chromium plating, finer upholstery and hardware that were features in their deluxe lines, have been eliminated. This is a step in the right direction so far as the fleet user is concerned.

We would like to see the manufacturers of the small, popular-priced cars go still further and develop "standard" models of 108, 110" wheelbase with smaller and more economical 4 or 6-cylinder engines of approximately 140-150 cu. in. displacement developing a maximum of 40 h.p.



Is this all the "dolling-up" the average fleet operator desires? Does he want small, standard jobs of about 108-inch wheelbase with really economical 4 or 6-cylinder engines? Is 2,000 lbs. weight heavy enough? Mr. Newton thinks so. What do you think?—H. C. F.

The coupe or sedan should weigh not over 2,000 lbs.; preferably less, and gear ratios and maximum engine speed should be such as would limit maximum road speed to 55 miles per hour. Rapid acceleration or pick-up is unnecessary and only moderate performance is required.

The car should have a standard tread, conservative low air pressure tires, a body designed for commercial work that will last as long as the chassis, with serviceable upholstery, durable seat cushions and shatter-proof glass.

Shackle bolts, king pins, universal joints and other such parts should be so designed and built of materials as to give long life without renewals.

More attention should be paid to adequate lubrication of all chassis parts and the means of lubricating these parts should be simplified. A good air cleaner of ample size should be standard equipment.

Every part of the car should be designed with ease of maintenance in mind. This is paramount.

Some may say that such a vehicle as I have visualized would not be desired by the public. Personally, I believe that higher fuel costs and higher commodity prices are going to popularize the small economical car a lot sooner than some people may believe.

I believe further that a car with such characteristics that I have outlined could be "dolled up" and "gadgeted" and offered as a deluxe model and that such a car would be welcomed by the public, if not in the so-called "standard" model.

Most of us in recent years have seen what can be done with lighter weight, pneumatic-tired trucks. We know that in many applications they have successfully supplanted the heavy-duty, solid-tired vehicle. We have seen what can be accomplished with tractors and semi trailers, 4-wheel trailers and 6-wheel trucks. Due to retrenchment programs which have been in effect during the past four years in very nearly all lines of business, we have not been enabled to replace some of the old vehicles that we have with those of the newer type.

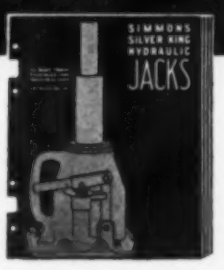
Busses, too, have been decreased

(*Please turn to page* 54)

First Choice OF MAINTENANCE MEN

1. One-piece body of certified Malleable Iron with tensile strength of 50,000 lbs. per sq. in. and yield point of over 32,000 lbs. per sq. in. Ball check, pump unit and oil reservoir cast integral with base. Tested leak-proof—greater strength.
2. Pyramid construction with pressure cylinder anchored top and bottom. Absorbs side stresses and distributes load from ram thru body. Eliminates leaks and loss of power.
3. Method of piloting ram gives maximum amount of lift to a given point and greater anchorage than in any other Jack.
4. Automatic breather unit allows intake and outlet of air thereby reducing cubic volume required in reservoir and permitting compact construction.
5. 30% less working parts. Simple, soundly engineered construction eliminates trouble found in other Jacks.
6. Oil strainer located in front of intake valve makes cleaning easy.
7. Takes greater overload than any other Jack of same rated capacity.
8. Operates easier. Only 60 lbs. effort on end of handle raises rated load.
9. Safe—cannot lower accidentally.
10. Recommended and specified 100% by Maintenance Managers of largest fleet operations.
11. A complete line especially designed for every service need.

SIMMONS SILVER KING *Hydraulic Jacks*



Send for the complete Simmons Silver King Catalog which pictures and describes in detail each Jack in the Simmons line. Whatever your requirements may be, you will cut costs and save time with a Simmons Silver King.

The Simmons Mfg. Co.
3650 East 93rd St.
Cleveland, Ohio

Send me a copy of your Jack Catalog without obligation

Name _____

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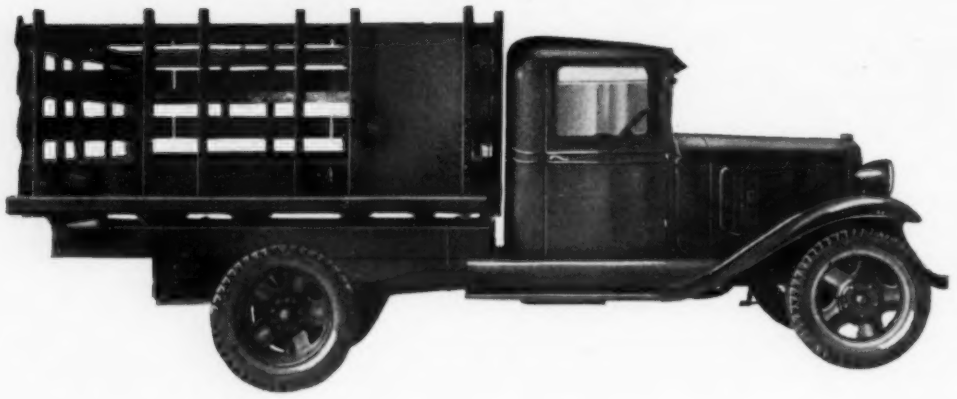
City _____ State _____

Say "I saw it in FLEET OWNER"—It Helps!

What We Expect *in a* 1½-Ton Truck



By Jean Babin

(Who Operates a 50-Vehicle Fleet in Newark, N. J.)

• *Everyone has his own opinion of what a 1½-ton truck should be like; unfortunately most opinions differ greatly. The writer of this article too, has his own ideas on the subject and would like to get the reaction of other fleet operators to them. It is to be distinctly understood, however, that these are the author's personal opinions and not those of the firm which he represents.*—EDITOR.

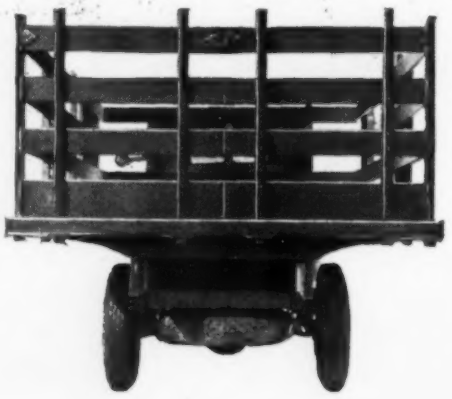
•

ONE of the most perplexing problems arising when a fleet operator gets ready to purchase new rolling stock for his business, has to do with the selection of the right type of vehicle. In other words, "What truck shall we purchase?"

What we have in mind particularly is the fleet operator whose fleet consists of 1 to 1½-ton trucks, such as would be used by bakeries, laundries, dairies, news dealers, etc. After carefully observing traffic on the highways, it is easy to perceive that the 1½-tonners seem to outnumber their larger brethren. However, despite this fact, the correct 1½-tonner for any certain line of business seems much more difficult to select.

Were we to go shopping for a so-called 1½-tonner for any of the above lines of business, for example, should we be satisfied with what the salesman calls *his* 1½-tonner? Let's analyze the various models likely to be submitted, and see what we find.

First we have the *heavy* 1½-tonner—a 1½-tonner by virtue of the fact that some manufacturer removes one of the dual tires from one of his 3-tonners and shortens up the frame. He will say, "There you are . . . The best 1½-tonner on the market." But this truck just will not do for certain kinds of work, particularly ours.



Then we have the other type, a *fancy* job. After looking over this 1½-tonner with its streamlined fenders, radiator and cab, its fancy instrument board, chromium plating, etc., we must admit that it's a dandy looker. But we also believe that if we had Sir Malcolm Campbell or the late Captain Seagrave with us, they would be inclined to say, "Let's take it down to Daytona and see what she will do."

From these two extremes which we have mentioned —the abbreviated coal truck chassis and the fast stepping truck with frills and furbelows—where can we put our finger down and say "Here is a *real* 1½-tonner."

In order to avoid further controversy, let us give you a rough idea of what *we* would like to see in a real 1½-tonner—particularly as would suit our requirements in the bakery business.

First we shall start with the motor. Why not a heavy-duty four-cylinder motor? "Why not a six or an eight?" you will say. Well—just because such users as we have mentioned above do not cover over a 75-mile radius from home. Then, too, a good 75 per cent of these users are governing their entire fleets at from 30 to 35 miles per hour. We don't mean to say "No sixes or eights allowed!" because they *are* needed in most fleets today to do certain kinds of work, but the truck we have in mind is mostly one for local work. Our kind of work does not require more than four cylinders.

To continue, let's have a crank handle that can be used, and one that's always in place, ready in case of emergency—one that won't break, slip, fly out or bind —one that won't knock out the man who does the cranking. A good husky crank handle is a necessity, we believe.

Another necessity is a *good* hand brake. We have not run across a real hand brake on our 1½-tonners purchased within the last six years or so. We want a hand brake that will stay put while the driver is out of the truck, just like those that we've had on our trucks during days gone by. Most of the late hand brakes that we've seen look more like toys than like a powerful stopping agent for a heavy vehicle.

Our idea of a radiator is one that can be removed easily when necessary, and without all the wiring that is found between the radiator core, shell and headlights. This will save considerable time on radiator and front-end work.

(Continued on page 54)

300 to 1 Leverage

TRU·STOP

EMERGENCY BRAKE

Do away with the constant danger of brakes that fail to brake. Give your drivers the confidence which comes from strong, sound construction and an over-margin of power. Tru-Stop Emergency Brakes have an actual 300 to 1 leverage. More efficiency than is really needed.

What is equally as important to you is the fact that any mechanic or driver can keep Tru-Stop Brakes in perfect adjustment, quickly replacing shoes where necessary.

Tru-Stop Brakes can be mounted on all standard transmissions—or on frame cross-member. They are made with single and double shoes adapted to either light or heavy duty.

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What Gear Ratios for Fleet Sales Cars?

By Charles Reedy

In Which the Question of Economy is Discussed, With a Possible Sacrifice of Spectacular Performance, That We Do Not Need, Anyway

DO the users of pleasure cars in commercial service (such as coupes for salesmen, traveling representatives, etc.) demand higher operating efficiency at somewhat of a sacrifice in performance? Are fleet operators less interested in spectacular and flashy performance than the private car owner? Would they be satisfied with cars that would be more economical in engine life and fuel consumption, even if they did not perform as well on the hills and required more frequent gear shifting in congested traffic? Is the average fleet sales vehicle overpowered? Would such a vehicle, so geared as to provide less engine revolutions per mile, be the answer to many of the fleet operators' problems?

Believing that the answer to all of the above questions is "Yes," the writer has spent quite some time on this subject and offers the following information to whomever it may interest, free, gratis and for nothing.

Among the basic laws of mechanics are found the following: "*Increasing the speed of an engine increases the power losses as the square.*" In other words, the power that is lost in reversing reciprocating parts and in the inefficient operation of an engine at high speeds is four times as great at 3,000 r.p.m. as it is at 1,500 r.p.m. This law explains why the same car will require from 15% to 30% more gasoline when its engine is geared to revolve 3,000 revolutions per mile than when geared to revolve 2,250 revolutions per mile.

Another law is: "*Increasing the speed of an engine increases the strains on the mechanical parts as the square of the speed.*" Government breakdown tests show that an engine revolving continuously at 1,500 r.p.m. will last four times as long as one revolving 3,000 times per minute. Still another law is: "*Noise, heat and vibration increase with the speed of the engine.*" This fact is self-evident, although in the case of vibration, there is a certain critical speed at which vibration might be great, even though it might not be a particularly high speed.

With these facts in mind it should not be hard for you to agree that the fewer times the engine must revolve per mile, the more perfect will be its operation above minimum speeds. Reducing engine revolutions per mile automatically tends to correct those faults on which the industry is spending millions of dollars in research—to cut down on gasoline and oil consumption, repairs and depreciation and to make a more comfortable car to drive. It would not be incorrect to say that the fleet operators themselves are also spending many dollars to bring about the above achievements.

The writer has been conducting experiments for the past fifteen years which subsequently have been followed up by one of the larger fleet operators in Cincinnati, in which he has proved his claim as to the lowest engine turn-over per mile permissible without sacrificing too much performance ability. As the topography in this part of the country is perhaps more severe (or as severe) as the *average* fleet car would encounter, it is logical to declare that if higher gear ratios will give satisfaction in this territory, they would be satisfactory in at least 80% of the territory covered by fleet cars throughout the United States.

There is, however, a limit as to how low an engine turn-over is permissible without sacrificing performance. The formula that the writer has devised fixes a definite "unit of value" which discloses the fact that the automobile engineers are not in complete accord as to the exact power delivery desirable from the fleet operators' standpoint of economical operation.

This formula shows, for instance, that one of the cars in the low-price bracket furnishes 100% more actual power per pound per mile, although its h.p. rating is almost one-half of the much higher-priced 12-cylinder car with which the comparison is made. The fallacy of judging the performance ability of a car by its h.p. rating is thus clearly shown. The real "unit of value" can only be found by taking into consideration *all* of the factors which determine the power delivered to the rear wheels.

This can only be arrived at by reducing all the cars on the road to the number of cu. inches displaced per pound per mile, which results in giving you a common denominator that would show the actual power delivery available. In fact, there are no two cars made today that provide the same power on the basis used by the manufacturer of the light car mentioned above. Even the cars made by this company differ as to power delivery, since they all use the same tires, rear axle gear ratio and engine for their 7-passenger sedan as they do in their business coupe.

Getting back to the tests, these were made by one of the largest local fleet operators in Cincinnati, who chose the three cars in the low-price bracket. The tests disclosed that these cars were all de-

(*Please turn to page* 54)

One Fleet's Experience

IN the fleet equipped for experimental purposes as mentioned in this article, it was necessary to analyze each vehicle separately, taking into consideration the tire sizes and the total weight of the car, equipped for service.

The management is satisfied with the savings made in gasoline and oil and is of the belief that still greater savings will accrue from the standpoint of less maintenance and depreciation and less time out for service.

Are the hands of new car engineers tied so that they must offer performance above everything? Do fleet operators really want something different in the way of passenger cars, that would not be acceptable to the public? You'll find some of the answers in this article.

60,000 Miles

and still going strong . . .

60,000 Miles So Far

Previous brake linings failed at 12,000 miles. J-M Brake Blocks have delivered 60,000 and are apparently good for many more miles.

To date, the Schenectady Railway Company reports: *J-M Brake Blocks have been in service 60,000 miles on their 40-passenger, 100,000 miles on their 20-passenger Twin Coaches*

BIG mileage figures? "Interesting," you say, "but under what kind of operating conditions were they obtained?"

Let the Schenectady Railway Company supply the answer on J-M Brake Blocks.

The 40-passenger Twin Coaches. Service between Schenectady and Albany. Fast schedules. High speeds on the open highway. A run which includes numerous hills and grades, considerable driving through heavy traffic in Schenectady and Albany.

Brake linings previously used gave constant trouble. After 12,000 miles they were replaced by J-M Brake Blocks. Average mileage to date, 60,000, with the J-M Blocks still in service and apparently good for many miles more.

Now the 20-passenger Twin Coaches. In city service in Schenectady. Heavy traffic to buck. Passengers taken on and discharged every few blocks. Frequent brake applications. But the J-M Brake Blocks (original equipment) are still in service after averaging 100,000 miles to date.

In the case of both the 40's and the 20's, the Schenectady Railway Company reports brakes functioning smoothly, safely, dependably at all times.

J-M engineers are available for complete surveys of all equipment, or for consideration of any specific brake problems. No cost. No obligation. And may we send you a copy of the J-M Brake Reliner's Manual? 124 pages on relining, adjusting, trouble shooting. *It's free.* Mail the coupon.

100,000 Miles to Date

Original equipment on the Schenectady Railway Company's 20-passenger Twin Coaches, J-M Brake Blocks are still in service after 100,000 miles.

Johns-Manville

BRAKE BLOCKS

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Service **Manual.**
Desired ( ) **You may arrange for a J-M Brake Survey.**

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Say "I saw it in FLEET OWNER"—It Helps!

Servicing Cam-and-Lever Steering Gears

By S. L. Bradley,
Ross Gear & Tool Company, Lafayette, Ind.

The Third of a Series of Factory-Sponsored Bulletins • How to Service Cam-and-Lever Steering Gears With Roller-Bearing Stud

THIS installment on steering gear servicing will cover the factory-sponsored instructions for the lubrication and adjustment of the Ross Cam-and-Lever Steering Gear with Roller-Bearing Mounted Stud.

1. Follow these instructions closely. Improper adjustments ruin more gears than any other cause.

2. Do not try to cure wander, shimmy or road shock by tightening the steering gear.

Lubrication

3. Through the pipe plug hole (1), fill housing slowly with steering gear lubricant until it begins to run out of vent hole (8). Do not use ordinary grease.

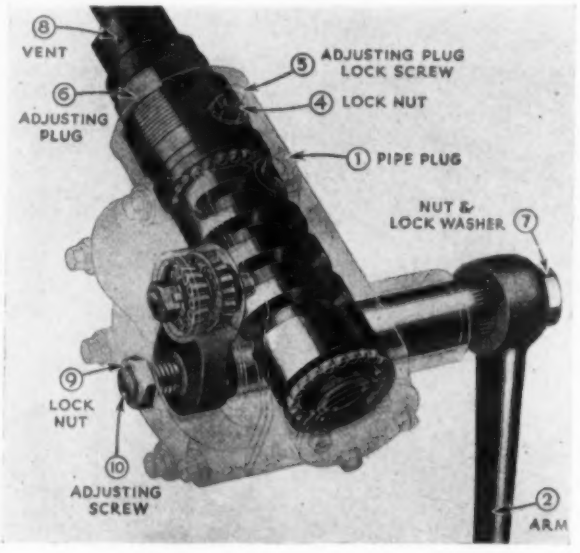
4. Repeat every 5,000 miles. It may be necessary to do this oftener in some cases.

Adjustments

5. Disconnect drag link from steering gear (preferably by removing drag link rear ball socket).

6. If the jacket tube is held in the adjusting plug by means of a clamp bolt, loosen the bolt. If there is no clamp bolt, the tube is pressed into the plug and the dash bracket clamp must be loosened so that the tube will turn when the adjusting plug is turned.

7. NOTE: A and B are the only adjustments. Always make adjustment A first.



A. Adjust Thrust Bearings to Take Up End Play of Cam

8. End play of cam shows up as end play in steering wheel tube.

9. Before making this adjustment, loosen the housing side plate adjusting screw (9, 10) to free the stud in the cam groove.

10. Back off lock screw (4, 5) and turn adjusting plug (6) until a slight drag is felt when turning the steering wheel, then back off plug (about 1/6 of a turn) till wheel turns freely without any up and down movement of wheel tube. Tighten lock screw and nut.

B. Adjust Tapered Stud of Lever in Groove of Cam for Backlash

11. Backlash shows up as end play of lever shaft.

12. The groove is purposely cut deeper in the ends than in the mid-position. This produces a high range through mid-position and makes the groove narrower through this range. This permits take-up of back lash in the mid-position, even after normal wear of the groove, without causing a bind in the ends.

13. Adjust to this mid-position high range.

14. Do not adjust in the end positions. Play in the end positions is not objectionable.

15. Tighten side cover adjusting screw (10) until a slight drag is felt through the mid-position high range when turning the steering wheel slowly from one extreme to the other.

16. Important. The gear must not bind any place. Only a slight drag should be felt. A closer adjustment will not correct any steering condition, but will damage and wear the parts and impair operation.

17. When the proper adjustment has been made, tighten the lock nut (9) and then give the gear a final test.

18. Make sure steering gear ball arm (2) is tight on the splined shaft and that the lockwasher and nut (7) are tight also.

Clamp Gear in Car

19. Tighten adjusting plug clamp bolt or dash bracket clamp (paragraph No. 6). Turn wheel to see if the gear turns harder. If it does, the steering column is out of alignment. In that case, proceed as follows:

(a) Loosen dash bracket (and if necessary) frame bracket, and align gear. It may be necessary to shim the dash bracket. Do not spring the steering column to the bracket.

(b) See that the frame bracket is tight to frame and rigidly clamp gear so that it does not spring when the wheel is turned (when the drag link is connected and wheels are on the ground).

(c) Test gear to make sure that tightening the brackets has not caused the gear to bind.

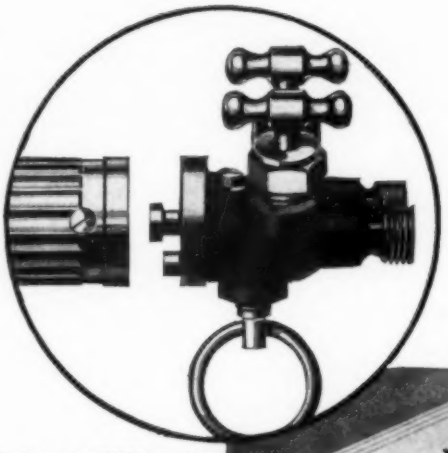
Connect Gear to Front Wheels

20. Turn the steering wheel as far to the right as possible; then rotate the wheel in the opposite direction as far as possible and note the number of turns. Turn the wheel back just one-half of this total movement, thus placing the stud lever in the mid-position.

(Continued on page 28)

Who...

MAKES PREST-O-WELD BLOWPIPES ?



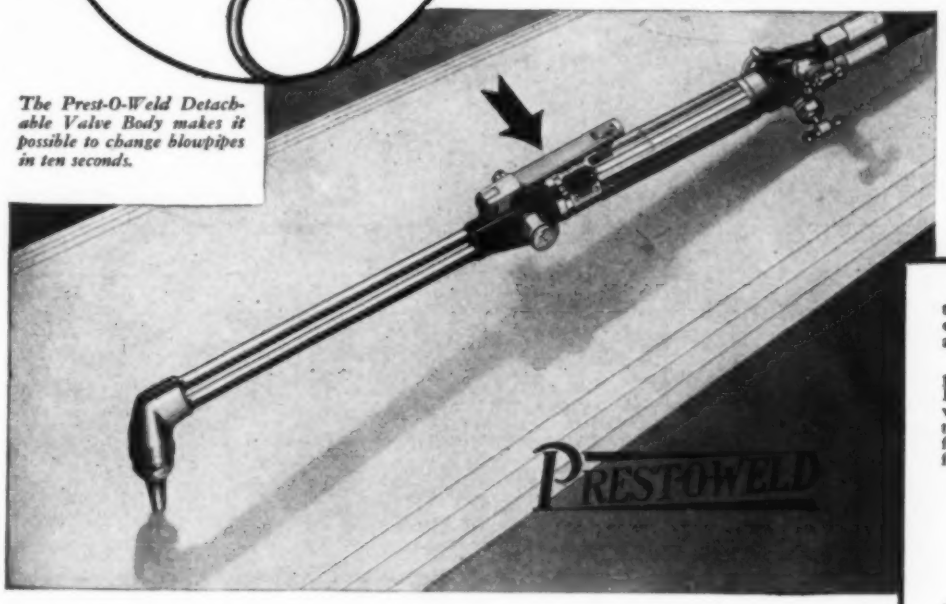
The Prest-O-Weld Detachable Valve Body makes it possible to change blowpipes in ten seconds.

PREST-O-WELD Blowpipes are made by Oxweld Acetylene Company, the largest manufacturer of oxy-acetylene welding and cutting equipment. In buying Prest-O-Weld Blowpipes, you share the advantages this company is able to give you as a result of its leadership in the welding and cutting field.

Made by Oxweld and sold by Linde, Prest-O-Weld not only can draw upon the resources and rich experiences of these two organizations—it also benefits from the extensive oxy-acetylene research activities of the Union Carbide and Carbon Research Laboratories, Inc.

When you buy Prest-O-Weld, you get apparatus that is scientifically accurate in design, extremely low in gas consumption, rugged in construction, and light and comfortable to handle.

Your jobber will be glad to show these and other advantages of Prest-O-Weld Blowpipes to you.



The new Prest-O-Weld Type C-105 Cutting Blowpipe, for all cutting up to 12 in., is equipped with the Prest-O-Weld Detachable Valve Body.

This light, well-balanced blowpipe is especially designed to resist rough handling. Its patented conical nozzle protects the seat when the nozzle is dropped. The head, cutting valve body, and lever are pressure forged for added strength. A 75 deg. angle head is furnished as standard.

Prest-O-Weld Type C-105 Cutting Blowpipe complete with 4 nozzles, lighter and wrench..... $42.00

Prest-O-Weld Type C-105 handle assembly with 4 nozzles, lighter and wrench (same as above but without valve body)..... $34.00

Prices slightly higher west of Rocky Mountains.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants UCC 627 Warehouse Stocks

IN CANADA, DOMINION OXYGEN COMPANY, LTD., TORONTO

Sales Offices:

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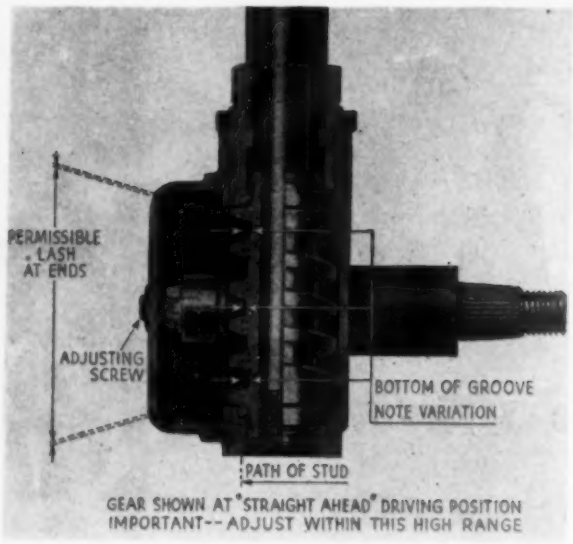
LINDE OXYGEN · PREST-O-LITE ACETYLENE · OXWELD APPARATUS AND SUPPLIES · UNION CARBIDE

A "HOW-TO-DO-IT" ARTICLE (*Continued*)


PERMISSIBLE LASH AT ENDS
ADJUSTING SCREW
BOTTOM OF GROOVE NOTE VARIATION
PATH OF STUD
GEAR SHOWN AT "STRAIGHT AHEAD" DRIVING POSITION
IMPORTANT--ADJUST WITHIN THIS HIGH RANGE

Place the front wheels in position for straight-ahead driving. It should then be possible to connect the drag-link to the ball on the end of the steering gear arm without moving the gear to any appreciable extent (in most cars the steering arm will hang vertically). If this cannot be done, remove the arm from the steering gear and place it on the splined shaft in the proper position. This is extremely important as any other position of the arm will change the effective ratio obtained from the gear and will not permit full throw of the front wheels equally to the left and to the right.

21. Refill the steering gear housing with recommended lubricant.

To Adjust Roller Bearing Unit

The foregoing procedure covers the usual adjustment to the steering gear and probably will suffice in all instances. In rare cases it may be necessary to inspect the roller-mounted stud bearing unit in the lever shaft. This should not be done, however, except as an adjustment for natural wear, which is negligible. Caution: Do not nick or burr finished surfaces.

A. If the inspection shows too much end play in the stud:

(1) Grip straight cylindrical part of stud in vise with nut end up.

(2) Straighten out prong of locking washer.

(3) Tighten nut carefully until a slight drag is felt when turning stud with the fingers. A new bearing should be set a trifle tighter than one that has been used.

(4) Tap each end of the stud lightly and test adjustment.

(5) When adjustment is proper, select the prong of the locking washer which is at right angles to a side of the nut and bend up against the side so that nut cannot move. If one is bent up that is at an angle to the side of the nut, the adjustment may change, due to the nut not being securely fastened. Do not use a washer twice unless the prongs used the first time have been first removed.

(6) Test adjustment.

(7) Wash bearings in clean gasoline and dry with compressed air.

B. If the stud bearings show tightness or binding:

(1) Tap each end of stud lightly and then test. If still tight, proceed as in A, except that the nut should be loosened, of course, until proper adjustment has been attained.

CAN YOU TIE THIS GOOD TIRE RECORD?

A RECORD of tires on trucks operated by the Northern Transit Company of Fargo, North Dakota is furnished by The B. F. Goodrich Rubber Company, Akron, Ohio.

In its entirety the record is believed to be one of the most impressive ever set up by a fleet operator. Mileage on tires numbered 176, 183, 184 and 186, for example, are all over 100,000 or close to it. Records on Numbers 159, 175, 177, and 180 are also gratifying.

The figures are an excellent testimonial to the service provided by this operator as well as to the tire quality. The often repeated statement that constant care will add thousands of miles of tire service is emphasized by the report.

All tires listed here still have many more safe miles in them, the operator says. A complete service record of each casing is being kept, so that even more outstanding marks will be set before the tires are removed from service.

The tire service chart follows:

Tire No.	*Present Mileage*	*Tire No.*	*Present Mileage*
144	47,834	184	113,149
150	57,565	186	99,449
151	42,549	200	38,582
159	75,240	201	37,591
160	44,262	202	37,556
161	56,398	203	38,582
162	44,262	204	38,582
163	28,499	205	28,499
177	77,696	206	38,582
180	74,600	147	69,926
182	52,920	175	89,341
183	97,877	176	111,333

The Editor will be glad to hear of other excellent tire records. Fleet operators, as well as tire manufacturers, are invited to submit data of this kind from time to time.—H. C. F.

HOW SHINY IS SHINY?

By getting a scientifically correct answer to this question and others, du Pont assures the economy, lasting appearance, and durability of Automotive DULUX Finish for your trucks.

160 trucks of the Laub Baking Co., Cleveland, Ohio, are finished 100% with Automotive DULUX, chosen after thorough investigation of many different types of finishing materials to obtain one that would give the longest wear and retain the best appearance.

HOW MUCH LIGHT does a paint film reflect? Does it have the required gloss? In answering these questions the human eye is untrustworthy. So science supplies the exact eye—an instrument that tells just how shiny a paint film is.

This test is part of the du Pont system of Pre-Testing which controls and guards the properties of *every* du Pont Finish. It assures your obtaining in Automotive DULUX a uniformly high quality product that will preserve the good appearance of your trucks, resist the wear and tear of road duty, and save you money and delay in refinishing. DULUX is a product of scientific development and manufacture...*NOT* one that is produced by guesswork or rule-of-thumb methods.

The superiority of Automotive DULUX is being proved daily by owners of many fleets. Specifically they find that DULUX resists scratching, the harmful effects of gasoline, oil, and other things that destroy ordinary finishes. DULUX can be polished more frequently without wearing through. Touching up need not be so frequent if DULUX is on the job.

Decide to reduce truck refinishing and maintenance costs now by having your own refinishing shop or an Authorized du Pont Refinisher apply DULUX. Application is easy and quick either with spray or brush. We will help you draw up standard DULUX specifications for your fleet. This service has been extended to others at no extra cost. For further information write E. I. du Pont de Nemours & Co., Inc., Dept. F-5, Finishes Division, Wilmington, Delaware.

DU PONT — AUTOMOTIVE — DULUX

REG. U. S. PAT. OFF.

DU PONT MAKES A COMPLETE LINE OF AUTOMOTIVE REFINISHING MATERIALS

Say "I saw it in FLEET OWNER"—It Helps!

Do Worn Plugs *affect* Fuel Consumption?

•

"Yes," Say Spark Plug Engineers, and Here Is the Proof in a Form Not Too Technical • Engine Power Suffers Too, You'll Notice

DURING the combustion cycles of a gasoline engine, certain combustion residuals accumulate on the spark plug insulators, gradually forming a coating. This coating often has the peculiarity of having a low electrical conductivity when cold, and good conductivity when hot. In this latter condition, the coating will act as a shunt across the spark plug gap and, at times, may short enough ignition energy so that no spark will jump the electrode gap. The electrical conductivity of this coating increases proportionally to the insulator temperature.

In an automobile engine the spark plug insulator temperature changes continually, mainly following throttle openings, engine speeds, changes in mixture ratio (caused by acceleration or deceleration) and wind variation.

Also, the sparking voltage necessary to jump the spark plug gap is proportional to the gap size (electrode wear) and mainly follows engine compression changes (throttle opening), electrode thermionic emission (electrode temperature) and mixture ratio (throttle opening and engine speed).

The combination of a variable conducting coating over the insulator and a variable sparking voltage may cause intermittent ignition missing which is responsible for loss of power and higher gasoline consumption.

The higher the electrical conductivity of the coating over the insulator, the lower will be the maximum sparking voltage which the ignition coil will deliver, so a point is usually reached when the maximum coil voltage is less than the breakdown voltage of the spark plug gap and, therefore, no spark will occur at the spark plug gap, with consequent ignition cutting-out or missing.

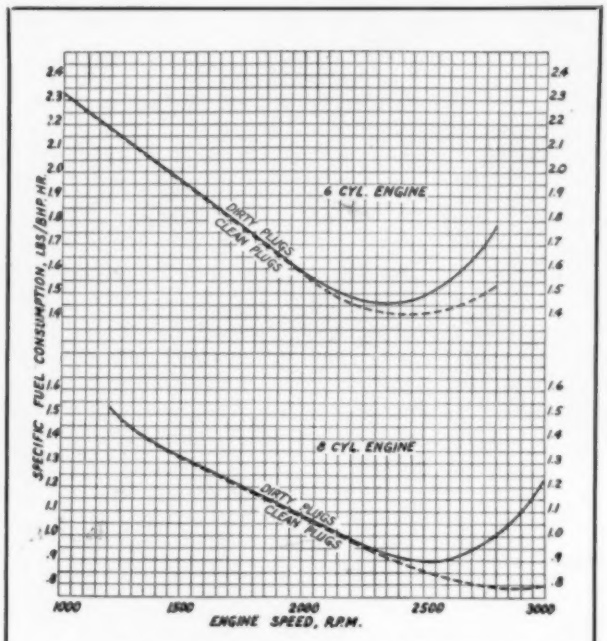
Besides ignition missing, this conducting coating over the insulator, not being homogeneous in conductance, causes intermittent sparking at some point on its surface, when no spark occurs at the spark plug gap because the energy of the spark is diverted through this coating. This surface sparking causes a delay in the combustion, such as if the ignition is being retarded, due to the new spark location inside the spark plug and consequently the explosion is weaker.

This succession of ignition misses and weak explosions causes a drop in engine power and an increase in fuel consumption. Every time the throttle is suddenly opened, as when accelerating, the sparking voltage suddenly rises, due to the increased engine compression. If the spark plugs are old and the insulator coating leaks, most likely the engine will not have the "pep" we expect, because the higher the spark voltage at the gap, the easier will ignition missing occur for a given electric leakage over the spark plug insulators. This combustion coating over the insulators, having an oxide base, tends to glaze the insulators at very high temperature.

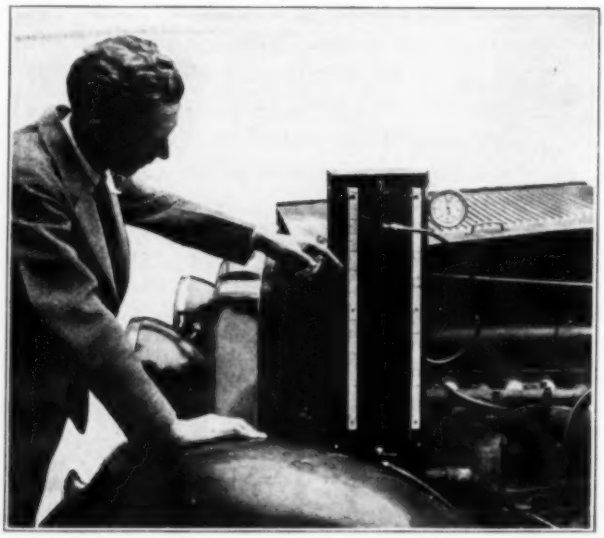
A carbon deposit, on the contrary, the electrical conductivity of which is high when cold, burns away at high temperature, leaving the insulators intact.

By using a stroboscope with a quartz window facing the spark plug, plugs with a conducting coat over the insulators can be seen firing steadily at the spark plug gap until the coating becomes hot enough to cause current leakage, at which point sparking over the insulator coating inside of the

(*Please turn to page* 56)



As specific proof, this graph shows a difference in fuel consumption when using clean spark plugs and when using dirty ones. Examples are shown from both a six and an eight-cylinder engine.



Flowmeter tests show that spark plugs, if badly worn or have been used over 10,000 miles, cause a waste of 1½ to 2 pints of gasoline an hour.

SENSATIONAL ANNOUNCEMENT

in Oil Purification Opens Way to Fleet Operators of 5 or More Vehicles to Save Hundreds of Dollars Each Year

SKINNER MOTORS, INC., pioneers and leading manufacturers of automobile oil purification equipment, announce something entirely new in crankcase oil purification—

THE STREAM-LINE FILTER

Oil purification—the recognized economical practice for fleet lubrication—has now been developed to a point never before equalled. The Stream-Line Filter will purify your crankcase oil with a thoroughness and completeness possible with no other method.

All chance of error due to the negligence of the operator is eliminated—the machine is absolutely automatic and positive in operation.

To eliminate any danger of changing the original structure, no acids, alkalies, or other chemicals are employed before, during, or after purification—the resultant product always possesses the same lubricating value as the new oil in service.

All non-lubricating contaminants down to 1/250,000ths of an inch are removed, including the finest carbonaceous matter in colloidal suspension. The majority of these cannot be removed by centrifugal force or other mechanical means employed by plate and frame presses, pressure or gravity filters, and precipitating equipment.

The cost of this super-purification is reduced to a new low level—averaging 1½c to 4c per gallon, including all costs. (Stream-Line Filters are available in sizes to meet every need—priced from $125.00 up.)

Don't continue to discard your crankcase drainings. Don't run the risk of undue engine wear by changing your oil too infrequently. Investigate the Stream-Line Filter. There is a Skinner Representative in your locality. The coupon below will bring full information or the representative who will demonstrate, right in your own garage, how the Stream-Line will remove all impurities from YOUR crankcase oil.

SKINNER MOTORS, INC., 2225 DALZELLE STREET, DETROIT, MICHIGAN

We want to know more about the new Stream-Line Filter.

☐ Have your representative call. ☐ Send us complete information.

Name_____

Address_____

City_____ State_____

Say "I saw it in FLEET OWNER"—It Helps!

Developments in Hard-Facing of Parts

No regrinding of this hard-surfaced valve seat will be necessary, even after 150,000 miles, hard-facing experts declare.

INDUSTRY in general during the past year has shown an increasing interest in the use of hard-facing materials such as Haynes Stellite. With the demand constantly growing for greater efficiency and longer life of parts, including better new parts as well as the salvaging and putting to work again of worn parts, it is only natural that the trend has turned toward the use of materials which most successfully solve these problems.

To many persons, undoubtedly, the use of hard-facing material applied by the oxy-acetylene process is an old story. To others, the use of the process has developed recently from the very urgent need of reducing costs and making equipment that is already in use do more and better work.

To many manufacturers, the use of hard-surfacing as applied to new parts has become standard practice because of the manufacturer's desire to put on the market a better piece of equipment. But in whatever way the process is now being used, it is a fact that everyone is becoming more fully conscious of the possibilities inherent in the process, and is turning to those who know, to find out more of what can be done with such hard-facing material.

There are certain applications which have been recently developed that show great promise in the automotive industry. Take for instance, the recently developed application which is gaining widely in popularity, namely, the hard-facing of automotive exhaust valves and valve seats. Three prominent bus and truck manufacturers have already standardized on hard-surfaced seats for all of their standard run of motor blocks.

Exhaustive tests have proved the desirability of Stellite for this purpose. No regrinding or refinishing of the seats has been necessary after runs as high as 150,000 miles, and even after these long runs, the seating surfaces are in as good condition as when installed, it is claimed. Contrast this with the life of ordinary cast iron seats, which is estimated at 10,000 miles between grinds.

Besides the valve seats already mentioned, the automotive and aircraft industries find such applications as hard-surfacing valves, dies, cams, clutch pressure plates and fingers, tappets, pump shafts, tail skids, tire chains, and similar applications. Progressive mills in the lumber and paper industries have found the hard-facing of hog anvils, chipper bed plates, chipper chutes and clutch jaws to be economical.

And so it goes. Other industries, many of which are reached by this publication, will find this development of equal importance. Among these is the application of Stellite to gate and globe valves for high pressure and high temperature steam service. Facings of this cobalt-chromium-tungsten alloy are applied to seat rings and disks by means of the oxy-acetylene blowpipe and such built-up surfaces combine stainless qualities with hardness. Seat rings and disks hard-faced with Stellite are resistant to wear and scoring and are also sufficiently tough and corrosion resistant to withstand "wire drawing."

Hard-facing finds many other applications in practically every industry. Its use in the excavating, dredging and quarrying field has increased enormously during the past year, particularly because it has become well known that the life of such parts as dipper teeth, bucket lips, dredging cutters, tractor treads and similar equipment is increased from 3 to 10 times by the application of hard-facing materials to their wearing surfaces.

Where abrasion is intensified by

(*Please turn to page* 56)

Whether it's a 40-pound valve for a Diesel engine, or a small passenger-car valve seat, hard-facing will increase its useful life. So the exponents of hard-facing tell us.

ARE YOU CARVING DOWN BATTERY MAINTENANCE COSTS?

Leading fleet operators have turned to Exide Batteries as a significant means of lowering maintenance costs. They know that battery trouble can tie up a truck either in the garage or on the road, causing costly delays. They have learned that Exide Batteries minimize such occurrences, and at the same time reduce battery maintenance.

It is a fact, proved by commercial operators throughout the country, that Exide Batteries hold maintenance costs to a rock-bottom minimum . . . that they deliver dependable service, and seldom need repairs of any kind during their long life.

Why not carve your own battery maintenance costs down *for good* by standardizing on Exide Batteries?

•

EXIDE ENGINEERING SERVICE is available to fleet operators without cost. Conducted by trained and experienced battery engineers, it can help you cut maintenance costs.

Exide

BATTERIES

FOR EVERY TYPE TRUCK

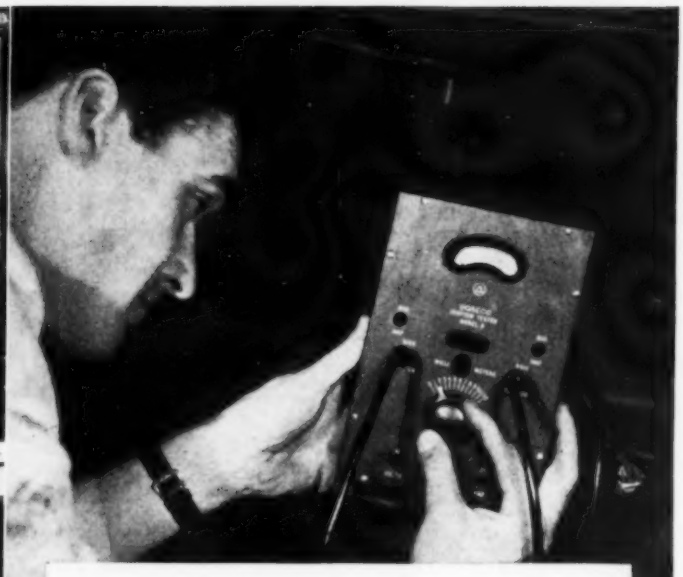
THE ELECTRIC STORAGE BATTERY CO., Phila.

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

Say "I saw it in FLEET OWNER"—It Helps!

How 4000 fleet owners as much as



FIRST STEP IN SAVING MONEY

is the scientifically accurate test on the Cities Service POWER PROVER. In 30 seconds this exclusive Cities Service invention analyzes exhaust gases and shows whether the engine is operating at 65%, 50% or less of its efficiency... indicating wasted power and gasolene. Hundreds of fleet operators have been amazed to find engines operating inefficiently immediately after their "sight and sound" adjustments. Yours may be the same. And it will take the POWER PROVER only 30 seconds to reveal this hidden waste of fuel and money.

CORRECTING THIS WASTE

is the second step. Cities Service has developed a 23-step tuning and adjusting routine that replaces guesswork with scientific accuracy. Many of the tuning and precision instruments used are exclusive, patented Cities Service inventions. Unnecessary waste of gasolene is eliminated, power increased, overhauls are needed less frequently, danger from carbon monoxide is greatly reduced. This tuning routine frequently increases engine efficiency from 50% to 85%. Your own mechanics can apply the 23-step procedure.

THE CITIES SERVICE BIG THREE

NEW KOOLMOTOR

The famous high-test, anti-knock green gasolene, for which hundreds of thousands have gladly paid 2 cents premium...now yours at no premium.

CITIES SERVICE ETHYL

The new champion of Ethyl gasolenes . . . fast, tremendously powerful... a super anti-knock gasolene. Backed 100% by the Cities Service name and reputation.

CITIES SERVICE POWER PROVER

This exclusive Cities Service invention that instantly detects unnecessarily wasted fuel and power. Combined with the 23-step Cities Service tuning routine, using exclusive patented precision tools, it stops this waste.

RADIO CONCERTS—*Fridays at 8:00 p. m., E. D. T., over WEAF and thirty-three N. B. C. stations*

CITIES SERVICE POWER PROVER

Say "I saw it in FLEET OWNER"—It Helps!

have cut gasolene costs

30%

...and lowered operating and maintenance expense by having their trucks and buses POWER PROVED

GASOLENE MILEAGE SUBSTANTIALLY INCREASED

Your drivers notice the difference at once. Routes that used to consume 25 gallons of gasolene may make it on 20 gallons. Operators of fleets, large and small, report savings of from 10% to 33⅓% on gasolene and oil after POWER PROVER Service was made an established part of the maintenance routine. Scientifically adjusted motors do not waste gasolene and are more powerful under heavy loads on the hills and the straightaways. And your drivers have greater protection against deadly carbon monoxide fumes.

SAVINGS SHOW ON PROFIT SHEETS

The many savings POWER PROVER Service makes possible show up definitely on monthly profit sheets. Executives see gasolene and oil costs grow smaller . . . maintenance expense decrease . . . replacement charges dwindle . . . less spoilage of perishable foods from exhaust gases during delivery. And these savings are available to you through POWER PROVER Service at approximately only one cent per day per vehicle! It will pay you to investigate at once this proved way of making operations more profitable by lowering fuel and maintenance costs.

SEND FOR THIS FREE POWER PROVER INFORMATION

Start saving money on your fleet today by writing for additional information on how more than 4000 fleet operators in various industries have cut oil and gasolene costs and reduced operating and maintenance costs through POWER PROVER Service. Mail the coupon today.

CITIES SERVICE POWER PROVER
Room 702, 60 Wall Street, New York, N. Y.
Gentlemen:

I am interested in receiving further information on how, at trifling cost, I can cut my gasolene and oil bills as much as 30% and lower my operating and maintenance costs. Without obligation on my part, please send me this information

*Name*_____

*Address*_____

Say "I saw it in FLEET OWNER"—It Helps!

Trailers *and* Six-Wheel Units Increasing

"More Rubber on the Highway" as Well as Lower Ton-Mile Costs Responsible for Widespread Usage of Modern Equipment

By H. C. Bennett*

THE first trailer developed and used was built for the purpose of transporting a load which, by reason of its great length, width, height or single-piece weight, was impossible to handle with any truck alone. The trailer thereafter became more and more in demand for this purpose, with a definite and permanent niche in the field of highway transportation as an auxiliary to the motor truck.

Trailer manufacturing shops were soon available in practically all important trucking centers in the United States. The business of these trailer shops was limited entirely to their local community, just as in the case of the village blacksmith shop, and naturally these factories were little more than modernized forge shops.

For a good many years this situation continued, with no possible standardization of trailer design by reason of the wide variety of uses they were put to. No two were built alike, and the quantity production of a standardized model, such as factories require for economical manufacture, was not available.

Conditions surrounding the manufacture of the modern trailer of today have changed greatly, with its widespread use for purposes entirely foreign to the hauling of loads of odd shapes or extreme widths and lengths. The tremendous tonnage moved in these times over the highways requires that larger transportation units be used, rather than having countless small trucks on the highways trying to do the job with traffic congestion resulting. With larger units it became necessary to equip them with a great number of large pneumatic tires for the protection of the country's highways.

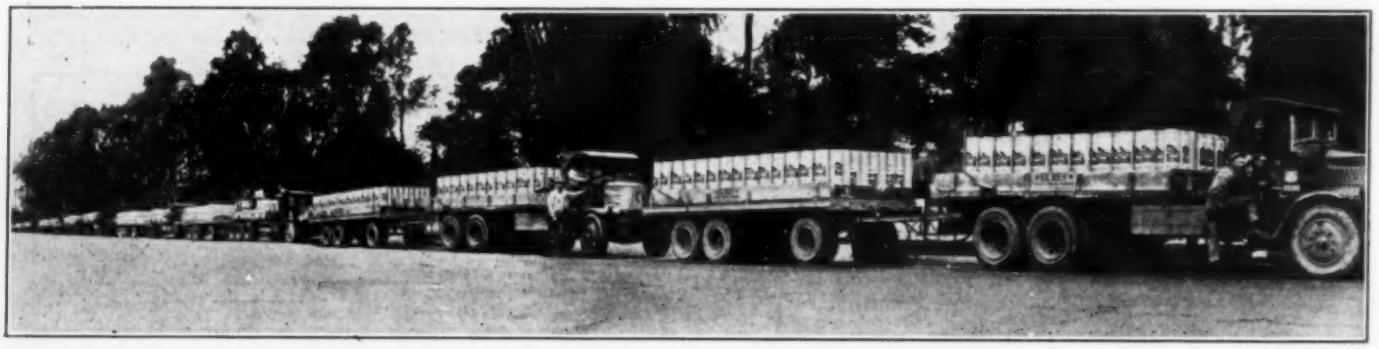
The problem of getting sufficient rubber under such loads has been solved completely by the modern trailer, without which the load of any transportation unit would be restricted to the amount of rubber applicable to the truck alone, and comparatively that amount is very limited if practical operation is to be maintained.

This modern use of trailers has greatly standardized the design and enabled trailer builders to operate modern factories on a quantity production basis, with a widespread system of distributors for the marketing of their products.

The six-wheel attachment (third axle), used extensively for converting four-wheel trucks over to six-wheelers, such as developed by the Utility Trailer Manufacturing Company of Los Angeles, California, has likewise undergone a similar betterment in manufacturing conditions.

Original attachments of complicated designs were necessarily fitted to the truck and built on it, much as suits of clothes are each tailored to fit many different men with many varying proportions. However, six-wheel attachments, strictly secondary to the truck, are required to match its tread, brakes, frame height and width as well as to have interchangeable wheels, rims and tires. In short, they must be so finished and equipped as to give the appearance of being an original and integral part of the truck on which they are mounted. The factory accomplishes this end by furnishing its various distributors throughout the United States with six-wheel attachments that are variable to fit any make or capacity truck. Obviously, standardization of models and reduced cost of volume production has resulted.

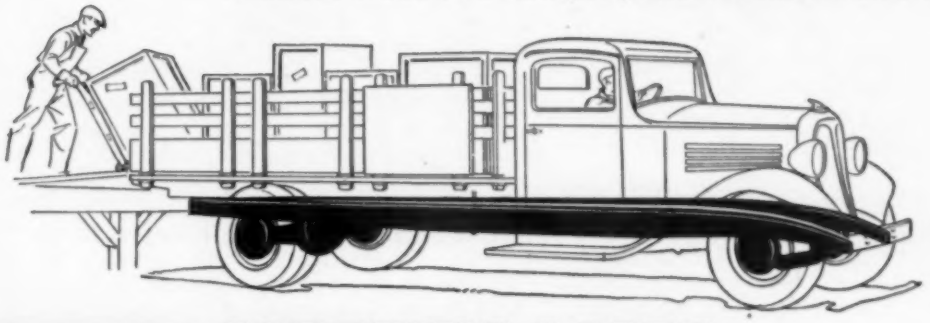
* *Manager, Utility Trailer Mfg. Co., Los Angeles, Calif.*



What is
A Motor Truck?

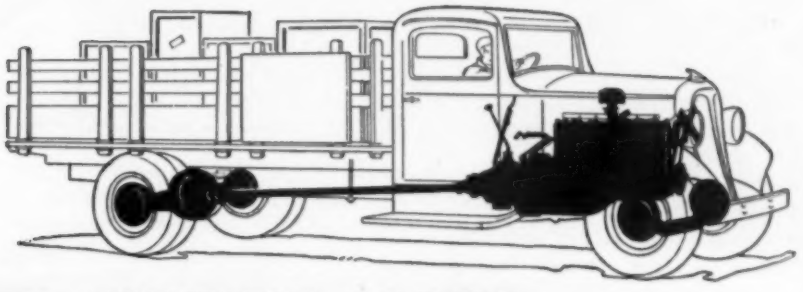
A simple question—yet one that truck buyers *ought to ask* far more often than they do.

A motor truck is a self-propelled vehicle used for



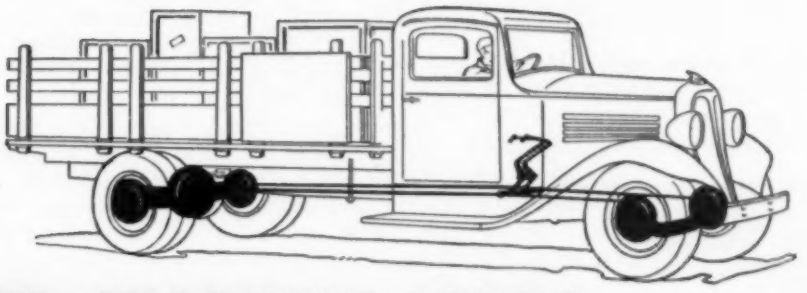
● ● Carrying the load is the function of FRAME and AXLES.

CARRYING LOADS . .



● ● Moving the load is the function of POWER PLANT and AXLES.

MOVING LOADS . .



● ● Stopping the load is the function of BRAKES and AXLES.

STOPPING LOADS . .

More attention to axles will mean fewer mistakes in buying hauling equipment.

LOOK UNDERNEATH

There's no surer index of quality in a motor truck, no better guarantee of low cost in operating and maintenance than Timken and Wisconsin Axles.

DTA CO WISCONSIN AXLES

THE TIMKEN-DETROIT AXLE CO., *Detroit, Michigan*

WISCONSIN AXLE CO., *Oshkosh, Wisconsin*

Say "I saw it in FLEET OWNER"—It Helps!

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

Regarding Regrooving and Retreading

Question: In recent months there has been considerable agitation regarding the retreading and regrooving of pneumatic tires. There seems to be much divergence of opinion regarding the economics involved. Have you any data on these subjects?—B. M. C., Chicago, Ill.

Answer: The practice of regrooving pneumatic tires reached its height about a year ago, when many machines for this purpose were placed on the market and extensively advertised. We do not hear so much about them just now.

From a safety standpoint, regrooving promises many advantages, although opinion among fleet maintenance men seems to be divided as to its actual effectiveness in service. We published a rather thorough article on this subject. See page 26 of the March, 1933 issue of this publication.

Of course, in deciding whether or not to regroove a tire, due consideration must be paid to the condition of the carcass, the amount of tread rubber, etc. In our opinion, regrooving can be done successfully *once* during the life of each pneumatic tire, *before* it becomes worn down too far. It does not seem necessary to follow the original tread design, three annular grooves being sufficient, since most skids are side-skids, fleet men tell us. Regrooving in this manner does not seem to minimize forward "sliding" and other fleet men are strong for making cross-grooves, or following the tread design.

With reference to regrooving solid tires, this practice, as you no doubt know, has been carried on for many years and little need be said about it here.

And now with reference to retreading. This is a subject that bobs up every once in a while. During the period of extremely low tire prices, this practice seems to have been forgotten. Now that tire prices are rising again, more activity on the part of re-treading machine makers is being witnessed.

We have not as yet run across any fleet operators who are doing retreading, or having it done, and are inclined to believe that if this practice prevails at all, it is among smaller fleet owners; also there are many mail-order houses offering re-treaded tires to car owners.

Naturally, the manufacturers of re-treading machines are making intensive efforts to bring about the practice of re-treading and in a recent issue of a tire magazine, we note six or seven machines of this type advertised. We shall be very glad indeed to hear from any fleet operators who have had recent experience with tire re-treading.

●

Regarding Water and Oil Temperatures

Question: I would like to know, if the motor of a truck, tractor or car could be warmed up quickly and then set at a certain temperature, what the advantage or disadvantage would be? I do not mean the water in the engine block, but refer to the oil in the crankcase. What would be the best degree of heat to set this at?

Wouldn't it be better to have oil at the correct viscosity for all temperatures than to have S. A. E. 10, 20, 30, 40, etc.?—C. S. B., Rochester, Minn.

Answer: It is common knowledge that the temperature of the oil in the crankcase will usually approximate that of the water in the cooling system. Normal operating temperature of automotive engines ranges somewhere between 150 and 180 degrees Farenheit.

Thermostatic control, as we have it today, tends to warm up the water in the engine when starting and this has some effect on warming up the oil as well. Of course, in very cold weather, the oil will probably be a bit cooler than the water, especially if the oil-pan is well exposed and not insulated, assuming that the radiator is protected by shutters or something. This type of automatic control is advantageous because it tends to keep the engine at its most efficient operating temperature.

Naturally, it *would* be better if we could keep engine temperatures constant, regardless of weather conditions, but automotive design has not yet made this possible, hence the various grades of oil, which are but a compromise with the weather man. The advent of oil-temperature regulators, which are warmed (or cooled) by the same water used in the cooling system, has been a step in this direction.

You May Not Believe It!

(But Here It Is)

THE FACT:

THE old idea of slowly warming-up cold engines before starting off, is wrong. It is best not to idle cold engines but to warm them up rapidly by racing them at about 1800 r. p. m. until they become warm enough.

EXPLANATION:

TESTS conducted by the Institution of Automobile Engineers (England) revealed that it is better to warm-up at 1800 r. p. m. at about half-load, which corresponds to a road speed of about 30 m. p. h. This, it is claimed, is a safe procedure for most internal combustion engines. For a more detailed explanation as to the reasons why, we refer you to the Editor's Page of this issue—Page 13.

*THIS PLATE

is your Key to low cost truck operation

$595 1½-2½ TON CHASSIS
F. O. B. LANSING, PLUS TAX
DUAL WHEELS EXTRA

* The Ability Rating Plate that you will find in plain view on every Reo Truck and Speedwagon bears these vital facts: (1) Gross load capacity of the truck. (2) Percent of grade it will climb in high gear, fully loaded. (3) Safe loaded speed on level roads.

That is what Reo means by ABILITY RATING—rating the vehicle specifically and honestly according to its true ability to deliver.

Reo does not merely offer an idle claim or hopeful estimate of what you may expect—but a definite advance picture of performance under any given conditions.

The reason why Reo can take this unprecedented stand is found in the Reo factory, in the Reo traditions of quality—in the knowledge that Reo trucks are built and balanced for *extra hard service and extra long life!* Otherwise such a specific forecast of RESULTS would not be possible.

With these results known in advance—with performance literally *pre-determined*—operators can plan their schedules and gauge their costs with a degree of precision unheard of before Reo developed ABILITY RATING.

Why buy a truck without first learning the details of this exclusive plan? Why not write Reo—or ask your Reo dealer—just how Reo has ended blindfolded buying and put truck selection and operation on a SOUND and SCIENTIFIC basis?

Reo Speedwagons and Trucks range from ¾ to 4-6 tons. New low prices—$530 and up. 32 wheelbases, all with Reo Gold Crown Engines. Tractor-Trailer units with correct load distribution and maximum pay load capacity. All prices chassis f. o. b. Lansing, plus tax

WRITE Reo today for the "Truck Superiority Book." This book will serve as an excellent guide in the correct selection of your next truck. It supplies accurate and invaluable data with which you may compare all trucks in the low price range.

The Reo Truck Performance Gauge gives the exact answer as to the truck best suited for your job. Before buying a truck, ask a Reo salesman to use this Gauge in determining your particular requirements

THE QUALITY TRUCK IN THE LOW PRICE FIELD

NEW REO DELIVERY UNIT

Clear Swing Rear Doors
No Wheel Housings
Full Vision Windshield
Insulated—Sanitary
Sliding Front Doors

$795 COMPLETE WITH BODY
Special Equipment Extra
f. o. b. Lansing, plus tax

This new combination unit is particularly well suited for delivery of milk, baked goods, bottled goods, groceries, etc.

REO MOTOR CAR COMPANY
LANSING MICHIGAN

TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

Modern Valve Design Stands Up Better

Question: We have had considerable trouble with an old Studebaker Big Six burning the exhaust valves. Standard valves have been used and they don't last very long. Can you suggest anything for this trouble?—A. H., New Jersey.

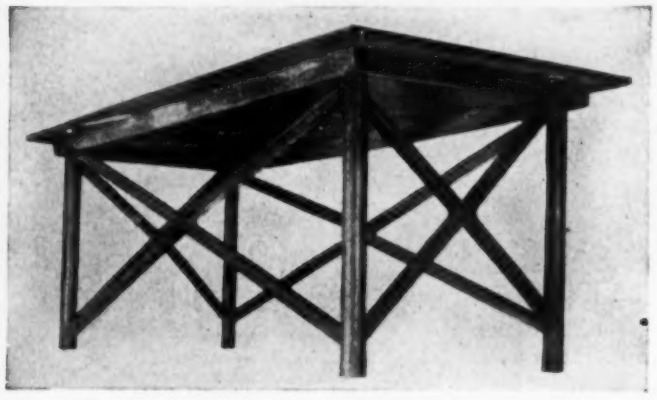
Answer: We would suggest about 8 to 10 thousandths tappet clearance on this motor, as the valves are very large. This might be somewhat noisy, but the valves would seat better, we believe.

You might also be able to obtain a better, steel valve from your jobber for this particular car. Although the original equipment called for cast-iron valves on both intake and exhaust, we believe you can get a replacement steel valve from some jobber of standard parts, which, according to modern practice, ought to stand up better.

●

A Simple, All-Welded Shop Bench

HERE is a work-bench built over ten years ago and still going strong. Certain features of its design, not to speak of its evidence of longevity, should be of interest.



It will be noticed that the bench is constructed entirely by oxy-acetylene welding, thus doing away with about 20 couplings and about 42 threaded ends. The bench was designed to carry loads up to 1000 lb., and in order to assure rigidity with strength, braces in the end panels and a solid cast iron top were used.

The layout is very simple, the legs being made of single lengths of pipe and the braces joined with butt type welds at the top and bottom of each leg. One half of each brace was made from a single length of pipe and the other half made from two pieces joined at the center crossing with butt type welds.

The general dimensions of the table are: length 52 in., width 22 in., and height 24 in. The four legs are made of 1½ in. diameter pipe and the braces of 1¼ in. pipe. And, according to *Oxy-Acetylene Tips*, the only tools required in addition to the measuring tools, were a cutting blowpipe, a welding blowpipe, and a hammer and chisel.

●

Fleet Executive Available (Adv.)

SUPERINTENDENT of Maintenance, or Assistant, with eight years of bus and truck experience, seeks connection with automotive fleet. First class mechanic with proven executive ability and low cost record. Excellent references. Address B. W. M., c/o Editor, FLEET OWNER, 90 West Street, New York City.

More About Last Winter's Paint Difficulty

PERHAPS we were not quite entirely understood in our Editorial which appeared on page 13 of last month's issue, entitled "Rubber Paint Wanted." We used the word "rubber" *figuratively*, only, and it was not our intention to comment on any paints that might or might not have rubber as a pigment material.

In this connection, the following paragraphs, issued by the National Paint, Varnish and Lacquer Association should be of interest; we know they will be to all fleet operators who have had difficulty with paint peeling last winter. Here is what they have to say about it:

"This unprecedented cold has apparently had a detrimental effect upon paint coatings, especially those applied to galvanized iron and zinc-coated metals used for the metal fronts of dwellings, bulletin boards, gasoline filling stations, and roofing of railway cars. In a few instances failures were also noted on furniture steel and other metal surfaces. Under normal conditions, paints will hold satisfactorily upon such surfaces, especially when galvanized metal has been allowed to weather for a few months before painting. Under abnormal conditions, lack of adherence may be shown on highly spangled galvanized surfaces. Allowances should therefore be made for all structural materials under extremely severe conditions."

"Microscopic inspection of these flakes almost invariably indicated the presence of from six to fourteen coats of paint. Apparently the greatest amount of flaking occurred on surfaces which had the larger number of coats. Moreover these coats appeared to be of different composition, color, and oil content. Naturally such films would have a greatly differing range of expansion and contraction when subjected to extremes of temperature, the outer coats usually being responsible for the pulling away of the inner coats and separation from the metal to which they were applied."

"The very few cases of flaking from passenger automobiles, which have been observed, would indicate that the finishing of automobiles is done with extreme care over properly worked out primers, whereas the painting of metal fronts of buildings and of sign boards is usually done in a rather hurried manner, without special attention to the primer."

"At any rate, it would be desirable for property owners to remove old, hard, thick paint films from some types of metal surfaces before they are repainted. This can be done with air-operated hammer scrapers or with paint and varnish removers, sodium phosphate solutions, or other commercially available removing compounds. It would also be well to bear in mind the fact that new and highly spangled surfaces of galvanized iron which have not been aged before painting are surfaces which are difficult to paint. Lack of adhesion may be shown, especially when such surfaces are subjected to quick changes of temperature. It would be desirable to roughen these surfaces, preferably with a sand blast. The sand blast will remove the outer skin of spangle and allow much better adhesion of the priming paints. Where sand-blasting is not available, etching solutions made of toluol, alcohol, and carbon tetrachloride containing dilute mineral acids may be used. The priming paints should be made with such pigments and liquids as have been proved by test to give good adherence to galvanized iron. Primers containing some zinc dust have been reported upon lately as having given satisfactory results on galvanized surfaces."

It is interesting to note that the presence of a number of old coats of paint caused more failures than where only a few coats were applied, and that properly treated metals gave much better results. Properly primed surfaces seemed to better withstand the extreme temperature changes, which fact should give us something to think about when refinishing such materials in the future.—H. C. F.

Four O.K. Warehouse moving vans finished with Sherwin Williams Exterior Kem Enamel Ivory.

SHERWIN-WILLIAMS
EXTERIOR KEM ENAMELS
for trucks, buses and transport equipment

(1) Work easily and freely under the brush;
(2) Cover solid in one coat on most surfaces;
(3) Do not "lift" old finish;
(4) Resist oil, gasoline and grease;
(5) Dry without sacrifice of durability, working qualities or gloss.
(6) Are quickly available anywhere in 24 standard colors.

Sherwin-Williams Exterior Kem Enamels were formulated for exterior surfaces requiring a free-flowing, tough, elastic, durable, high gloss finish which can be applied with a *brush*. They are based upon synthetic resins developed in our own laboratories. This resin, in turn, is treated with S-W Old Dutch oil—the same oil that made S-W Old Dutch Railway Enamel and Truck and Bus Enamel so highly esteemed in their fields.

Although made for the professional "brush hand"—Exterior Kem Enamels, due to their exceptionally easy working qualities, can be successfully used on large or small surfaces by the less experienced painter. The material has splendid flow and wonderful leveling free of brush marks. The resulting finish closely resembles porcelain.

Exterior Kem Enamels possess the fastest drying speed consistent with exceptional durability and fine working qualities. Under normal conditions (approximately 70° F.) they can be recoated in 6 to 8 hours. They dry dust-free in about 2 hours. A unit finished one day can be run out of the shop the next.

Send for complete finishing schedule and color card showing the 24 colors available at every principal distributing point throughout the country. No cost or obligation. Write The Sherwin-Williams Co., Dept. 623, Cleveland, Ohio.

THE SHERWIN-WILLIAMS CO.
Administrative Offices, Cleveland
Warehouses in Principal Cities

KEEPING TAB on the NEW TRUCKS

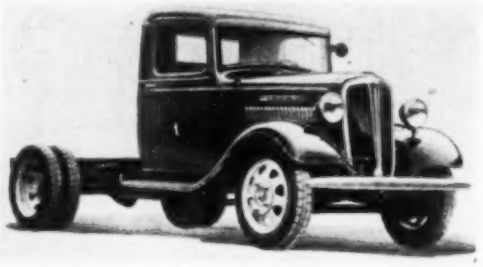
GENERAL MOTORS TRUCK

ENTRY into the lowest-priced 1½-ton truck field was announced last month by the General Motors Truck Company, Pontiac, Mich., with a new model, designated as GMC T-16, having a gross rating of 9,300 lbs.

The engine has 213 cu-in. displacement and delivers 70 h.p. at 3,300 r.p.m. A maximum torque of 147 ft. lbs. is developed at from 1,400 to 1,800 r.p.m. Engine refinements include rifle-drilled connecting-rods, main and rod bearings of the replaceable steel-backed type, and electro-plated pistons.

Power is transmitted through a truck-type clutch and transmission, needle-bearing universal joints and tubular propeller shafts, to the full-floating rear axle. Other chassis features include truck-type frames with straight side rails, semi-elliptic springs, four-wheel mechanical brakes with centrifuse rear drums, and demountable Spokesteel wheels.

Wheelbases available include 131-inch and 157-inch for the various models. An attractive cab is provided, having many refinements of practicability and driver comfort. Other details may be obtained on request to the maker.



Here's a view of the new GMC T-16 truck chassis with cab. This job is available with a variety of standard bodies, such as panel, stake, express, canopy, platform, high rack, etc.

INTERNATIONAL

IN the design of the new Model C-1, ½-ton six-cylinder International motor truck, consideration has been given to the demand for pleasing lines and color combinations. A sloping V-shaped radiator with polished stainless steel molding and satin-finish aluminum grille, deeply crowned and valanced fenders, streamline hood and cowl all help to make this new C-1 an attractive-looking light hauling unit.

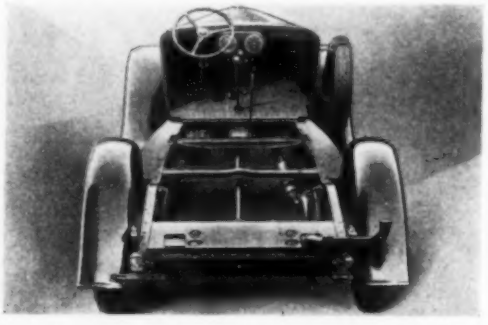
The wheelbase of 113 inches was designed for light delivery bodies, and the frame is reinforced by numerous cross members. The cam-and-lever steering gear, roller bearing anti-friction joints, hydraulic pressure-gun chassis lubrication and chrome molybdenum steel axle shafts are noteworthy chassis features.

The engine of the new Model C-1, ½-ton International, develops 78.5 maximum brake horsepower at 3400 r.p.m. Low-cost engine maintenance and operation is facilitated by removable and replaceable precision-type main and connecting rod bearings, hardened exhaust-valve seat inserts, pressure lubrication, downdraft carburetion and air cleaner. The bore is 3-5/16 inches and stroke 4⅛ inches. The total displacement is 213.2 cubic inches. Maximum torque of 151 pound-feet is developed at from 800 to 1400 r.p.m.

The 9-inch clutch is of the single-plate type, with built-in vibration damper. The transmission provides three speeds forward and one reverse, with respective reductions of 3.06 to 1, 1.6 to 1, 1 to 1, and 3.77 to 1. Extra long semi-elliptic springs are used. Front springs are 36½ by 1¾ and rear 51 by 1¾ inches.

Attractive bodies of the de luxe panel, station wagon, canopy express and all-metal pick-up types are available and all are designed for quick loading and unloading. Inside dimensions of the panel body are 72 inches long, 55 inches wide at belt, and 52 inches high. The double rear doors are provided with large stationary windows and self-latching locks. A single adjustable bus-type seat is standard equipment in the panel body.

The International cab on the new Model C-1 is also attractively lined and is equipped with sloping one-piece windshield, deeply crowned one-piece steel roof, and comfortable seat wide enough for three persons. International Harvester at Chicago will be glad to send literature on this model if you want it.



Looking at International's new ½-ton truck chassis from astern. By looking at it from this direction, you miss the sloping V-shaped radiator, with polished stainless steel moulding and aluminum grille; also the streamlined hood and fenders.

This picture gives some idea of the wide range in size and utility now offered by Marmon-Herrington. The small truck is the lightest in the line. The large one is a four-wheel-drive Diesel-engined job with semi-trailer, for freight hauling.

And, last but not least, here's Federal's latest bid for low-priced leadership. It's described fully in the column at the right; the rest of it you'll find on page 60. Standard chassis finish is black, with red hood, cowl and wheels.

MARMON-HERRINGTON

THE addition of seven new models to the Marmon-Herrington line of all-wheel-drive trucks is announced by Bert Dingley, the company's vice-president in charge of sales. Two of the new models are gasoline-powered vehicles and five are equipped with Deisel engines.

The entire Marmon-Herrington line now consists of five series of all-wheel-drive trucks and truck-tractors with a total of 28 different models ranging in capacity from 1½-tons upward. This is said to be one of the most complete lines of all-wheel-drive vehicles ever placed on the market.

Seventeen gasoline-powered Marmon-Herringtons now are available to the buyer. The two new models in this division are the TH340-4, a four-wheel-drive unit with a capcity of 20 tons, and the TH340-6, a six-wheel-drive vehicle with a capacity of 35 tons.

Introduction of the five new Diesel models brings this type of Marmon-Herrington to the 5 and 6-ton fields. Heretofore, the smallest Diesel-powered unit in the line was a 7-ton unit. There now are eleven Marmon-Herringtons with Diesel engines available to the buyer.

The Diesel models are the THD310-4, four-wheel-drive, capacity 5 to 5½ tons; the THD310A-4, four-wheel-drive, capacity 6 tons; the THD340-4, four-wheel-drive, capacity 20 tons; the THD310A-6, six-wheel-drive, capacity 10 tons, and the THD340-6, sixwheel-drive, capacity 35 tons.

Bert Dingley, at the Marmon-Herrington factory in Indianapolis, Ind., will be glad to send you complete details without obligation.

FEDERAL

THE Federal Motor Truck Company, Detroit, Mich., enters the lower price field with 1½- and 2-ton chasses listing at $645.00 and $845.00 respectively, F.O.B. Detroit.

These new Federal trucks have a maximum gross rating of 10,000 pounds for the 1½-ton when equipped with dual rear tires, and 11,000 pounds for the 2-ton. Standard chassis weights are: 1½-ton,

(*Please turn to page* 60)

NOW BETTER LUBRICATING OIL

as low as 6¢ PER GALLON

WITH THE PERFEX-OIL RE-REFINING SYSTEM

Fleet owners—every barrel of crank case oil you throw away is worth just as much as a barrel of new oil. Take the dirt, moisture, gasoline and acidity out of it and you have a better lubricating oil than when it was new. Highest automotive authorities are on record substantiating this fact. U. S. Bureau of Standards, technological paper No. 223 states "lubricating oil does not wear out . . . . if re-refined by a suitable process it may be as good or even better than the original oil."

Here is that suitable process. The Perfex-Oil System brings it right into a 2 x 6 corner of your shop. Ten minutes a day of a shopman's time is all it takes to operate it. It is priced so low that any fleet owner draining as little as a barrel a month can save its cost every year. Figure Perfex-Oil at 6c per gallon against what you are paying for oil now. See what you can save. Then send for full information about The Perfex-Oil System. See what fleet owners say about its simplicity, efficiency and economy. See the laboratory analysis on Perfex processed oil. Plan now to put your crankcase draining into the bank via the amazing Perfex-Oil System. *Send the coupon or write now.*

FULLY AUTOMATIC—Just one valve to turn. Starts it operating, maintains correct refining temperature and shuts off operation when last drop of oil enters distill.

ELECTRIC—SAFE—NO FLAME—Perfex distills by vapor-tight electric heat unit. There is no flame or open fire hazard of any kind. Operates from light socket. Safe as a light bulb.

NO MOVING PARTS—Perfex-Oil System has not a single moving part—no motor—no pump—no fan—nothing to get out of order nor to consume current for power.

ONLY 10 MINUTES A DAY TO OPERATE—So simplified and fool-proof is the Perfex that any ordinary shopman can operate it. Ten minutes of his time will keep it re-refining oil day and night.

Three Times The Capacity Of Anything Near Its Remarkably Low Price

DISTRIBUTORS

To show the Perfex-Oil System operating is to sell it. *Write for distributing franchise.*

PERFEX-OIL RE-REFINING SYSTEM

CENTROPOLIS STATION -:- KANSAS CITY, MO.

Send full information regarding Perfex-Oil System to handle ..... gallons of crank case drainings per month.

Firm Name .....

By .....

Address .....

City ..... *State* .....

Say "I saw it in FLEET OWNER"—It Helps!

as WE GO to PRESS

(News of the Truck Industry)

THE effective date of the Trucking Code (NRA) has been extended to March 30th, 1934, so that by May 15th (45 days thereafter) all for-hire operators must have filed their minimum rates and must display the new insignia on all of their vehicles. Assessments are planned to the extent of $3.00 per vehicle for all for-hire vehicles, and 90c per vehicle against those in the not-for-hire class. These amounts are for the purpose of paying expenses of the registration procedure and for the insignia. As this is written, few other details are available, but your local association has all of the dope.

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A MAJOR obligation resting upon the highway transport operator and the manufacturer of motor trucks is the reduction of obsolescence among highway transport vehicles now on the public roads, according to a report summarizing the results of the Crusade for Economic Distribution Through Planned Transportation, recently conducted by the Brockway Motor Company. The Crusade has just closed after public presentation of modern trucks in eleven important business centers in the East.

•

THE 1934 edition of a hand-book entitled "Truck and Trailer Size and Weight Restrictions" has just been issued by the FWD Auto Company, Clintonville, Wis. This hand-book is of convenient pocket size, contains 56 pages and includes the laws for every state in the union, as to size and weight restrictions of trucks and trailers. The interpretations of the laws are approved by a responsible public official of each state, whose signature appears thereto, assuring an authoritative record of the various laws. This is a very handy thing to have, and the Editor will be glad to see that you get a free copy. Just drop us a line and mention the name of your firm, please.

•

A DECIDED upturn in general business conditions is reflected in the sales of White trucks and buses, according to figures revealed last month by The White Company, Cleveland, Ohio, for the first quarter of this year. Orders received by the Company for this period show an increase of 150 per cent over the corresponding months of 1933. March was the biggest month since 1930, more than 800 orders being received from 60 distinct types of business.

NO doubt you've heard of the changes in the Ford trucks. In case you haven't they include a new full-floating rear axle with straddle-mounted pinion, cast-iron cylinder heads, improved connecting-rod bearings and a re-styling of the radiator design. These apply only to the 1½-ton job, of course.

•

THE growth in the business of the Marmon-Herrington Co. Inc., Indianapolis, Ind., all-wheel-drive truck manufacturers, is shown in the large volume of 1934 business on the books, it is reported by Bert Dingley, vice-president in charge of sales. During the first quarter of this year the Company booked more actual business than in the entire twelve months of 1933.

•

NEW Chevrolet Standard Sixes, just announced, include the following models: Coach, Coupe, Roadster and Phaeton. Wheelbase is 107 inches and, compared with the 1933 cars, the 1934 models reflect a comprehensive revision of chassis and body design. These low-priced models are especially suitable for commercial use, the makers point out, and are priced quite a bit below the regular Master models. As we see it, the only thing missing is the "knee action." This may or may not be considered essential in fleet operation.

•

SALES volume on Pedrick piston rings for the first quarter of 1934 is 44.3 per cent greater than for the same period of 1933, according to The Wilkening Mfg. Co., Philadelphia, Pa. This increase extends to all channels —original equipment, as well as replacement. Evidence that this business recovery is nationwide is seen in the fact that all of the sales territories of Pedrick enjoyed approximately the same increase.

•

TWO important manufacturers of standard equipment assemblies, namely the Timken Detroit Axle Company of Detroit, Michigan, manufacturers of passenger car and truck axles, and the Ross Gear and Tool Company, of Lafayette, Indiana, manufacturers of steering gear assemblies for passenger cars and trucks, have recently appointed Wheels Incorporated, of New York, and Newark as their authorized distributors for the metropolitan territory.

A SIX-CYLINDER Diesel, called the "Waukesha Comet" was announced last month by Waukesha Motor Company, Waukesha, Wis. The manufacturers claim that this 100 h.p. job is especially suited to city and interurban bus and truck schedules, as well as for heavy haulage tractors and trucks up to 20-tons gross load rating. If you want to get complete details, P. C. Ritchie, advertising manager of Waukesha, will be glad to oblige, without obligation, of course.

•

TWO Diesel engines have also been announced by Buda, both of which are built on the M. A. N. (German) principles. They are six-cylinder jobs, with bores of 3-13/16 and 4 inches, and a common stroke of 5½ inches. Bosch fuel injection pumps are used and many of the typical Buda features are incorporated elsewhere in the engines, which are of the four-cycle type. The Buda Company, Harvey, Ill., will send all particulars. Just say the word.

•

SEVERAL new trucks, in the low-tonnage, low-price range, are announced by various manufacturers. For your convenience, we've printed brief specifications and photographs of them elsewhere in this issue. See page 42.

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REO'S shipments of Speed Wagons, trucks and buses during the first quarter of 1934 have been 3-1/3 times as great as during the first quarter last year, according to Elijah G. Poxson, general sales manager.

•

THREE horizontal engines are now being produced by Doman-Marks Engine Company, Amesbury, Mass., manufacturers of direct air-cooled engines. These develop 85, 104 and 111 h.p. respectively, at 2,600 r.p.m. The special features are air-cooling, and a maximum over-all height of 26 inches. Write for details, if interested.

•

EFFECTIVE about April 15th, all deliveries for Saks Fifth Avenue, Saks 34th Street and Gimbels Department Stores, are handled by United Parcel Service, according to a report recently received. Our congratulations, U. P. S.

Arrange to test "FOUR·FORTY" *on Your equipment Now!*

● Introduced one month ago, the demand for the new Packard "Four-Forty" Ignition Cable is so great that the factory cannot keep up with orders! As predicted, "Four-Forty" has proved to be the biggest forward step in years in ignition cable building.

On the basis of the remarkable superiority of "Four-Forty" over all other types of cable, in every conceivable kind of laboratory test, many operators are replacing their present cable immediately. Others have accepted our invitation to make a thorough test "on the job" to learn for themselves how this sensational new cable can give them better performance and save them money.

If *you* have not already arranged for a test on *your* equipment, see your jobber now. Packard "Four-Forty" has literally thrown into the discard all former standards of ignition cable performance. Don't fail to get the facts about the biggest ignition cable news in years!

PACKARD ELECTRIC CORPORATION
Warren, Ohio

AN EXCLUSIVE PACKARD DEVELOPMENT

—with an outside coating of secret formula, that to a degree never before known—withstands: the blistering of heat; the softening of oil; the cracking of cold; the wear of abrasion; the eating away of corona.

WHAT "FOUR-FORTY" IS

Rubber compounds are essential in insulating high voltage currents. But rubber is affected by heat, oil, corona, etc. So to protect rubber from these, outer coverings of cotton braid, coated with lacquer, have been used over the rubber. Packard, not satisfied, has sought for years a still better outer covering. And Packard has found it in "Four-Forty"—a rubber-like substance of inorganic base—a compound of secret, exclusive formula that is designed to give complete protection to the inner wall against the effects of heat, oil, grease, gasoline, abrasion, cold, corona, etc.

160. **What Every Truck Owner Wants to Know About Spark Plugs.** There, in ten words, is the title. It's a free booklet just issued by one of the leading spark plug and electrical equipment manufacturers. You will save lots of correspondence and time, by indicating Number 160 on our coupon below, if you want a copy. And you can get any of the other books listed on this page, too, just by marking down the number. If that's not efficiency, we'll eat your hat, felt or straw.

•

161. **Eccentricity!** There's no substitute for it, especially when it comes to valve-seat grinding, according to many engineers and manufacturers. And that's the way we're supposed to reseat our valve seats, especially those of the new inserted or hardened type. But don't take our word for it. Ask our service department to send you complete information about this method. It can be easily done by indicating No. 161 on the coupon. And there'll be no obligation to buy anything. For your Editor's one-car fleet, we'll stick to our screw-driver, but *you* cannot afford to refinish valve seats by obsolete methods. It's *your* move!

•

162. **Don't Walk a Mile for a Camel-Back.** Just use the coupon below and Number 162 will bring you a complete set of literature covering one truck manufacturer's latest truck models of the "camel-back" type. Call them "cab-over-engine" models, if you will. Or, you might even call them "engine-under-cab" trucks. We don't care how you say it. But if you indicate it with "162", we'll know what you mean and the literature will come to you free, of course.

•

163. **A Street-Cleaner's Job.** That's what many people think when they hear the term "Flushing, Long Island." And it would be a huge job at that. Flushing radiators also might seem somewhat formidable to some fleet men, particularly if the radiator is a big one and it has to be removed from the vehicle and the hold-down bolts keep turning when you try to remove the nuts. We've all been in the same boat at some time or other, haven't we? But that's all a thing of the past, now, since power flushing equipment has been designed to clean out both radiators and cylinder blocks without removing either from the vehicle. An interesting circular has just been issued describing this outfit. If you want a free copy, Number 163 brings one.

•

164. **More About Spark Plugs.** Here's another spark plug folder entitled "Commercial Type Champions". We'll give you one guess as to whose it is. This one shows the latest developments in heavy-duty spark plugs and gives recommendations (not ours) of the proper types to use in any kind of condition you may encounter. And since it's written in language that even your Editor can understand, you'll find it of interest and value. Number 164 secures a copy without obligation.

•

165. **All Things to All Men.** Sometimes that is expected of a publication. Sometimes it's expected of a paint or enamel. Here's one that is claimed to be equally suitable for wood or metal; to be easy to apply over old finishes; needs no polishing; is quick drying; retains gloss during its entire life; in fact whatever you've been looking for in a commercial vehicle finish. An interesting folder entitled "The Modern Finish" has recently been issued. Number 165 brings a free copy.

•

166. **Gasoline, Oil, Water, Air.** All vitally important to the operation of your fleet. But if you haven't the proper equipment for handling these important commodities, you're not only losing time but you're losing money, too! An interesting catalog that illustrates and describes a complete line of this stuff, from an oil measure to an air compressor, has just been issued by a firm in Conshohocken. But you don't even need to try to spell that word. Just put down Number 166 on the coupon and we'll get a copy of this catalog for you.

•

167. **Piston Pins and Valves.** Also other engine parts such as valve-guides, bushings, valve seat inserts, packless pumps, etc., are among the things you'll find in Thompson Products' latest catalogs. If your bookshelf or catalog file does not contain these, we'll see that you get them. But you'll have to help us by indicating your desires with Number 167.

•

168. **Comfort That Is Permanent!** Four words that mean a lot, if you consider how much it has cost you, last year for instance, to keep seat cushions in good condition. Take the strain of your drivers' backs. Take the strain off your cost-sheets, too! You can do both by equipping with the right seat cushions. And Number 168 on our coupon below brings an interesting folder that gives the "here's how". Get this and figure out how much *you* can save.

•

169. **The Trend to Alloy Pistons?** We don't know how many constitutes a trend, but one thing is certain. And this is that our Question-of-the-Month symposium on Pistons recently conducted, revealed a growing tendency towards aluminum pistons in all types of vehicles. And the choice was left to fleet men, not truck engineers. If, as it is said, aluminum pistons will lower your operating costs in 1934, you can take the first step towards proving it to yourself by asking for Number 169—the full details of latest developments in alloy pistons by one of the leading manufacturers. And it's all free for the asking.

•

170. **Truck Superiority?** A difficult thing to prove, especially since one man wants his 1½-tonner to be a husky work-horse, while another wants a fleety highway express. Just like you might like blondes and I would prefer brunettes. However, a new booklet entitled "Book of Truck Superiorities" has been issued and might serve as an excellent guide in the correct selection of your next trucks. Number 170 brings it, free, gratis and for nothing.

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

The Editor, FLEET OWNER, ...1934
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the.....issue. (Literature will not be sent unless firm name is given.) Order by number.

....

....

Firm Name .....

Address .....

City and State .....

Your Name ..... Position .....

READER SAY-SO

(Picked at Random from The Editor's Mail-Bag)

Reading Matter of Great Worth

"DEAR Editor:—I have been a regular reader of FLEET OWNER for several years and think I may safely say that there is not a publication today which is of more real help to a fleet operator.

"The monthly contribution of ideas through the Question-of-the-Month Department, Trouble Shooters' Department, Shop Kinks and articles by men who KNOW and DO, give us reading matter of great worth.

"Also, though you do not maintain a Bureau of Missing Persons, the writer recently established contact with an associate of 23 years ago, who, by the way, happens to be on the staff of FLEET OWNER. Have also managed to pick up traces of others through the trade news columns. You are doing a good job, H. C. F. Keep it up!"—*A. V. Nidy, Garage Supt., People's Outfitting Co., Detroit, Mich.*

●

Glad You Agree to This

"TO the Editor:—The writer was extremely interested in the article on Graphited Lubricants, carried in the March issue of FLEET OWNER. This article treats the subject in a very definite way and confirms the writer's contention regarding colloidal graphite.

"Your magazine, as devoted to the better operation of automotive fleets, is very interesting to the writer and we are keeping a permanent file of every issue."—*C. V. Wells, Auto Dept., Pillsbury Flour Mills, Minneapolis, Minn.*

●

Partners O. K. It

"DEAR EDITOR:—My partner and I read your magazine FLEET OWNER because it assists us so much in our trucking business. We operate a fleet of heavy-duty vehicles."—*McNichols & Chard Co., Chicago, Ill.*

Passed On to Shop Foreman

"DEAR MR. FISCHER:—I want to express my appreciation to you for the splendid work which FLEET OWNER is doing in the interest of better fleet operation and maintenance. This publication comes to me by way of our Mr. Cone, who is in charge of automotive maintenance for our Company. He passes it along to me each month. We operate a fleet of 20 trucks."—*Emory F. Phelps, Foreman, McKesson & Robbins Company, Fairfield, Conn.*

●

You Bet It's Consistent!

"DEAR MR. FISCHER:—I recently had occasion to read your most interesting February, 1932 issue of FLEET OWNER. If consistent, I would be pleased to receive one copy of this issue and would also like to have you place my name on your mailing list for all future copies of this valuable periodical."—*C. L. Fero, Supervisor Automotive Equipment, Boston & Maine Railroad, Boston, Mass.*

●

You Won't Miss It, Sir

DEAR Mr. Fischer: "Will you kindly change our address from 108 Warburton Avenue, to 9 John St., Yonkers, N. Y., as we are now at the latter location. We are requesting this as we do not want to miss a single copy of FLEET OWNER." —*Busch Brothers, Inc., Yonkers, N. Y.*

●

O. K. Captain!

"HAVING received copies of FLEET OWNER would say that I find it very useful and profitable. Thanks for the same and would appreciate further copies of this publication that you may care to send."—*Capt. F. P. Snow, Land Transportation Officer, Marine Barracks, Parris Island, S. C.*

Liked at Westinghouse

"DEAR Editor:—I was very much interested in the article on Graphited Lubricants which appeared in the March issue of FLEET OWNER, as it confirms our own practice and experience. Our shop force is always interested in FLEET OWNER and we appreciate the practical utility of the articles contained therein."—*C. A. Fike, Supervisor Plant Transportation, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.*

●

Monoxide Article Clicks

"DEAR MR. FISCHER:—The writer, who is a very faithful reader of FLEET OWNER, was quite elated upon reading the article of yours in the December issue, entitled 'Minimizing Monoxide in Bus and Truck Fleets.' If other men like yourself who have the press to work through, will get into action, we may be able to save some lives at least."—*C. S. Bristow, Waupun, Wis.*

●

We'll Welcome It!

"DEAR EDITOR:—I have been reading your publication, FLEET OWNER, for some time and I find that it has very many good things in it. Perhaps after a while I shall be able to give you some of our own experience data."—*C. S. Bigelow, Yellow Cab Company, Rochester, Minn.*

●

History Repeats Itself

"DEAR EDITOR:—I appreciate receiving your publication FLEET OWNER each month. It has valuable information that I like very much. We operate a fleet of 10 trucks, 1 passenger car and 6 other vehicles at this plant."—*A. DeMere, Supt. Auto Maintenance, Cudahy Packing Company, Sioux City, Iowa.*

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Some of the Interesting Replies to the Spark Plug Question (No. 42).

Porcelains Give the Most Trouble Here

"OUR average spark plug mileage is between 6,000 and 15,000 miles, the principal trouble is the burning or bubbling of porcelains. We do not have pre-ignition trouble, but we do have fouling conditions, if the plugs are not hot-running enough.

"We overhaul spark plugs; on the 2-piece type we renew the porcelains; on the one-piece type we clean with sand-blast cleaner. However, we prefer a 2-piece plug because the porcelains can be replaced easily.

"We do not use 'trick' plugs for oil-pumpers. On old style trucks mica plugs have given us very good results. We prefer the ⅞" size as most satisfactory. Our source of supply is the jobber."—*J. E. McLaughlin, Supt. Motor Equip., United Parcel Service, New York City.*

●

Do Sand-blast Cleaners Shorten Plug Life?

"SPARK plugs are replaced when necessary; we have no records of performance in our fleet of buses. Our most common troubles are due to split porcelains. We do not have any other troubles, provided the right type of plugs are used.

"We clean plugs on a sand-blast cleaner, which seems to shorten the life of the plugs. However, clean plugs make for better operation, and being able to check and clean them quickly, offsets this and helps to lower costs through better operation. We believe this applies to any cleaner of this type.

"We prefer a 2-piece plug as it is easier to clean and salvage. We do not use 'trick' plugs for bad oil pumpers. Our experience with mica plugs has been satisfactory in some jobs. We believe the 18 mm. metric plug is most serviceable, as the porcelains seem to split on the ⅞" plugs. Our source of supply on spark plugs is the jobber."—*H. J. Dempsey, Hornell Motor Coach Co., Hornell, N. Y., operating a fleet of 12 buses.*

●

Electrodes Burn .0017" per 1,000 Miles

"PASSENGER car spark plugs give about 15,000 miles; light trucks give about 8,000 miles; heavy trucks about 6,000 miles. This applies to new vehicles as well as older ones.

"Our most common troubles include burning away of the electrodes and fouling due to carbon soot. On high compression engines we get more burning; on older trucks the fouling occurs.

"Original equipment plugs are generally o. k. We do not use 'trick' plugs for oil-pumping motors. The one-piece plug is preferred by us as they are less liable to leak, and they are generally smaller and therefore run cooler. We have had no porcelain breakage due to shop handling.

"One of the difficulties we have encountered is that too many different wrenches are needed for spark plugs of the same size. Why not get together and have one size hex for all plugs of the same size? We purchase spark plugs from jobbers.

"Our own experience indicates a burning of the electrodes at the rate of .0017" per 1,000 miles of operation in passenger cars. How about some dope on this?"—*M. K. Kurtz, Lieut., U. S. Army School, Fort Sill, Okla., operating a fleet of 30 trucks, 12 buses, 5 passenger cars and 3 other vehicles.*

●

Short Hauls and Slow Speeds Easy on Plugs

"ABOUT 15,000 miles average is what we get per set of spark plugs, both on new vehicles and old ones. On our heavy-duty trucks, the plugs seem to last about two years.

"Our most common spark plug trouble is the burning-off of points. We do not have any other troubles to speak of and original equipment plugs seem to be entirely satisfactory.

"We prefer one-piece plugs, as they seem to give longer life. The ⅞-inch size is what we use, in any standard make plug of the proper type. The jobber is our source of supply.

"Our work is mostly short hauls at slow speed in traffic and any good plug of the proper type gives satisfaction."—*J. V. Goodrake, Supt. Trans., Rairdon Transfer Co., Kansas City, Mo., operating a fleet of 34 trucks and 5 passenger cars.*

●

Also Prefers 2-Piece Plugs; Easter to Clean

"WE do not keep mileage records of spark plugs, but simply replace or recondition them when they become defective. We have no spark plug troubles to speak of; during the past year we have only used 11 new spark plugs in servicing 21 trucks and 8 passenger cars.

"We feel that in many cases spark plugs are blamed for other defects in the engines. We find that in keeping the plugs spaced and cleaned properly, in an engine that is in good condition, with good ignition, good gasoline and oil, our spark plug troubles are nil.

"We do not use 'trick' plugs for oil-pumpers. We have had some experience with mica plugs, which have given excellent service. Spark plugs are obtained from jobbers."—*R. H. Fassett, Supt. Garage, El Paso Laundry, El Paso, Texas.*

MORE ABOUT PLUGS *and* PISTON RINGS *(Continued)*

Pays Tribute to Spark Plug Performance

"IF other equipment gave as little trouble as spark plugs do with us, our repair bills would be cut by more than half. Although we get between 15,000 and 20,000 miles per set of plugs, we have very few spark plug troubles—occasionally a cracked porcelain, that's about all. We have a bit of pre-ignition, however, which seems to be due to variation in the grade of gasoline used.

"Original equipment plugs are entirely satisfactory and we prefer the 2-piece type, which seems to perform better in the motor. We do not use 'trick' plugs for bad oil-pumpers; instead, we recondition the motors.

"We have had very little porcelain breakage due to shop handling and have had no experience with mica plugs. The ⅞-inch size has been most serviceable; we have had very little experience with others."—*Dwight H. Woods, Engineering Asst., Nashville Gas & Heating Co., Nashville, Tenn., operating a fleet of 21 trucks, 9 passenger cars and 3 other vehicles.*

Believes Reboring Is the Best Method

"PISTON ring replacement is done in our fleet when the condition of the motor warrants it, the symptoms being oil consumption, lack of compression and blow-by. The approximate mileages we get from piston rings are 32,000 on the passenger cars and 30,000 to 40,000 on the heavy-duty trucks.

"We used to believe in curing oil pumping and piston slap by the installation of special piston rings, and have used one of the popular ring-and-expander combinations that was extensively advertised several years ago, but the results have been unsatisfactory. In fact, the 'cure' did not last long enough to warrant the trouble.

"Our present practice is to use one replacement set of standard piston rings and then rebore. The pistons and rings are obtained from automotive jobbers."—*T. Rauch, Sec'y., Kohlmann Bros. & Sugarman, Inc., New Orleans, La., operating a fleet of 7 trucks and 5 passenger cars.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 44—Auxiliary Lubricants

(Top Cylinder Oils, Break-In Oils, Graphited Oils, Etc.)

What types or makes of the above listed lubricants do you use?.....

How are they used, introduced or applied? (Please check below)

☐ In Overhead Oiler; ☐ In Crankcase Oil; ☐ In Gasoline; Others.....

Do you use these continuously, or only for breaking-in new or rebuilt motors?.....

What advantages have you experienced from the use of the above?.....

.....

What disadvantages, if any?.....

.....

Do such lubricants do the work which their makers claim? .....

Does their cost justify their continued or intermittent use by you?.....

Do they increase, decrease, or otherwise affect the formation of carbon?.....

Do they tend to lengthen engine life and increase periods between overhauls? .....

Do they tend to lengthen the periods between connecting-rod adjustments?.....

Do they tend to decrease oil consumption?..... Gasoline consumption?.....

Do they tend to lengthen the life of valves, piston rings and bearings?.....

Do they affect engine operating temperatures?..... In what way?.....

If you have used lubricants of any of the above kinds, and have discontinued them for any reasons, please state your experience .....

.....

What quantities do you use, in relation to mileage traveled, fuel consumed, or oil used? (Please explain).....

.....

Have you noticed any general improvement in operation or costs that are directly traceable to the use of auxiliary lubricants? .....

Remarks .....

.....

We operate ..... Trucks; ..... Buses; ..... Pass. cars; ..... Other Vehicles

***Note:** If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.*

Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

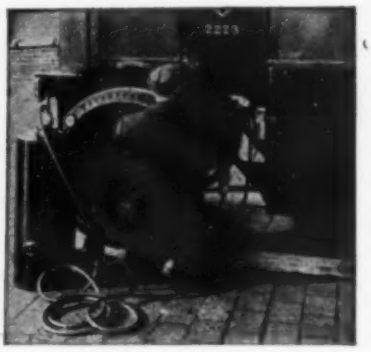
Name of Firm .....

Address .....

City and State .....

Your name .....*Position*.....

for ROAD *and* SHOP



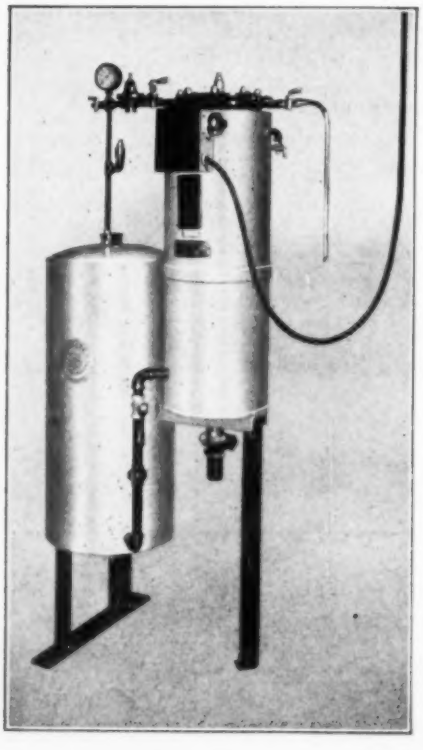
Skinner Announces "Stream-Line" Filter

NOW every operator of five or more vehicles can purify his crankcase oil for as little as 4c per gallon, all costs, and obtain the same lubricating value as from his new oil in service, according to Skinner Motors, Inc., Detroit, Mich. This announcement comes as the result of intensified research and the acquiring of exclusive patents of the "Stream-Line Filter," illustrated herewith.

The thoroughness and completeness with which this equipment removes all elements of a non-lubricating nature from drainage oils is better appreciated when it is understood that it filters to a fineness of 1/250,000th of an inch, all solids including the very fine carbonaceous material in colloidal form which pass freely through the finest mesh filter paper. These are separated by the Stream-Line Filter, the makers point out.

To better visualize the thoroughness and ability of this filter, another photograph shows 7½ lbs. of solids which it filtered from a drum of crankcase oil used in a fleet of 60 vehicles, each engine being equipped with a well-known oil filter.

Complete removal of all contaminants injurious to proper lubrication



is obtained, the Skinner people declare, by the principle of "edge filtration" in which thousands of flexible discs, 1⅝ inches in diameter with holes in the center, are stacked in a column and the oil forced by either pressure or vacuum to pass "between" and not "through" the flexible discs. As these discs are compressed to a pressure of 80 lbs., they form more or less a solid pack. Thus when the oil passes between the discs, it is separated into almost molecular or vapor form, and the impurities are collected at the edge and do not penetrate within the pack proper.

By merely reversing a lever, the filter pack can be automatically cleaned in two minutes. Moreover, as the pack is replaced but once a year, it is this interesting feature which accounts for the extreme low cost of operation per gallon of oil purified, according to the makers, and also assures the fleet operator a thoroughly purified oil. Other features pointed out include: may be installed in any corner; skilled attendant not necessary; requires but a few minutes' time per day of any of the garage personnel.

This equipment will be available in various capacities, in order to take care of various sizes of fleets. Complete details may be obtained by addressing Skinner Motors, Inc., 2231 Dalzelle St., Detroit, Mich. Mention of FLEET OWNER will help identify your request for information, which comes without obligation.

Data on Heavy-Duty Batteries

AN eight page booklet, "Specifications and Data for Bus and Truck Service Batteries" has just been published by The B. F. Goodrich Rubber Company, Akron, Ohio, and is now available upon request.

The booklet describes the new Goodrich line of truck and bus service batteries introduced a short time ago, gives the guarantee and adjustment policies, specifications and replacement data on batteries for all models of busses, trucks, fire trucks, taxis and tractors, as well as complete drawings showing assembly plans for each type of service.

Goodrich batteries for commercial vehicles were placed on the market following the company's successful introduction of its "Electro-Pak" and other batteries for automobiles.

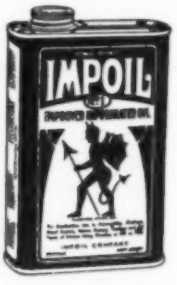
•

"Impoil" Graphited Lubricant

ONE of the popular auxiliary lubricants containing *colloidal* graphite, as mentioned in the article in our March issue, is called "Impoil," the can of which is illustrated herewith.

Impoil has been developed in response to the demand for an improved colloidal-graphite impregnated oil. Two grades are offered. Number 1, when added in small quantities to gasoline, increases efficiency by forming a mirror-like, heat-resisting, self-lubricating surface on upper cylinder walls and valve parts, the makers point out.

Number 2 was designed to be added to the regular crankcase oil. In this usage, it is claimed to impregnate and



to form a film on cylinder and piston walls, gears, bearings, connecting-rod and crankpin bearings and other moving parts.

While especially recommended by the makers for breaking in new or rebuilt motors, it is also suitable for use consistently "to make good oils better" as the makers put it. Write to Impoil Company, Denville, N. J., for further information.

What is A Trailer?

AXLES . . *primarily*

The way to keep trailer costs at bed-rock minimum is to specify Timken Tubular Trailer Axles—the accepted standard.

★ INTEGRAL ALL-STEEL UNIT

Timken's exclusive design offers a tubular beam with spindles, spring seats, brake mounting flanges; *all electrically welded into one integral unit,* ready for mounting brakes and wheels. No separate parts pressed on or keyed in place.

★ MORE STIFFNESS IN BEAM

Tubular section gives greater stiffness against bending under loads *in every direction,* than any other beam section for the same weight of steel.

★ GREATER STRENGTH OF BEAM

"Tempered steel" tubular beam. "Proportionate design" results in proper relation of spindle and beam dimensions for maximum strength.

We have some common-sense literature about the part good axles play in trailer-economics. Better write us for it.

THE TIMKEN-DETROIT AXLE COMPANY
DETROIT, MICHIGAN

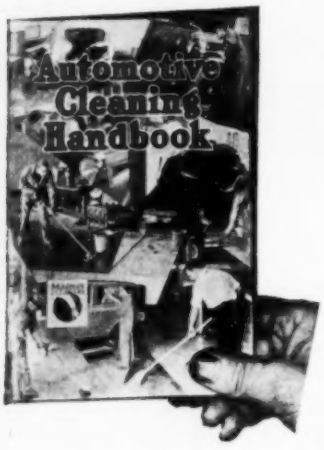
Say "I saw it in FLEET OWNER"—It Helps!

NEW STUFF *for* ROAD *and* SHOP *(Continued)*

Free—Automotive Cleaning Handbook

THIS book is, in effect, a practical "how-to-do-it" book on the subject of all types of cleaning in the automotive field.

It includes such subjects as radiator cleaning, car washing, steam-gun



cleaning, cement floor cleaning, parts cleaning and others frequently encountered in the fleet service station.

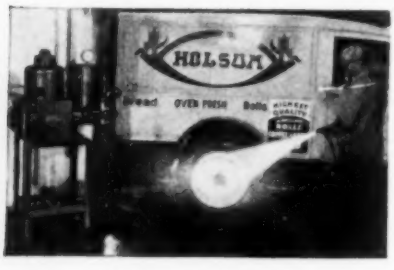
A copy of this book may be had free for the asking. Address: the Editor, FLEET OWNER, 90 West Street, New York City. We'll see that you get a copy promptly and without obligation.

•

New 20-Minute Car Washer

A NEW low-priced car washer is now being offered to fleet garages and service stations interested in economical car washing service.

The new car washer provides 300 pounds washing pressure and is equipped with a special gun permitting a fine mist spray to flush mud



and grit from the body finish without scratching. A heavy driving stream makes quick work of the chassis and for underbody cleaning, the makers state.

The speed with which this new double action model works makes it possible for operators to complete a wash job and, in addition, do other possible service work such as greasing, repairs, etc., on scheduled time, it is claimed.

Thirty days' trial and monthly payments may be had if desired. Write Hobart Brothers Company, Division CW, Troy, Ohio, for complete details, mentioning this publication, if you please.

Exhaust Gas Tester

THE Cambridge Exhaust Gas Tester, shown here, analyzes the exhaust gases of engines and indicates the results on a scale calibrated in terms of air-fuel ratio over a range of 10 to 15, and a corresponding range of 55% to 100% combustion efficiency.

This information is helpful in arriving at desirable carburetor settings, denotes the completeness of combustion and with proper interpretation, indicates certain mechanical conditions of the engine.

The instrument is furnished in an aluminum case 8" x 12" x 8" with cover; it weighs 29 lbs. Ten feet of rubber hose is supplied for conducting a sample of the gas from the exhaust pipe to the instrument. A stainless steel fitting is provided for insertion into the exhaust.

The instrument operates on the well-known thermal conductivity principle. A novel feature is the moving system of the galvanometer, wherein the complete movement is supported and floats in the field of the magnet, which absorbs shocks. This has the advantage of rendering the instrument usable in a moving vehicle passing over rough roads.

Operation is simple; an instruction plate is fastened to the front. Maintenance is confined to renewing two dry cells and cleaning the filter at infrequent intervals. For further details write to Cambridge Instrument Co., 3732 Grand Central Terminal, New York, N. Y.

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New Data Book on Dowmetal Issued

THE entire metal trades and many fleet operators will be interested in the new Dowmetal data book. It explains how this light structural metal may be fabricated by processes common in industry. The book itself is an attractive and well illustrated 64-page volume.

A description is given of accepted shop practice. Various available forms of Dowmetal are listed and described, such as sand or die castings, extruded shapes, forgings, sheet, plate and strip. Methods of welding, riveting, forming, machining are discussed in detail, with much information on designing and finishing.

This new data book is a most informative and enlightening document on the uses, properties and fabrication of the light structural metal known as Dowmetal. We are advised that for the time being, copies may be had by writing to the Dowmetal Division of The Dow Chemical Company, at Midland, Michigan.

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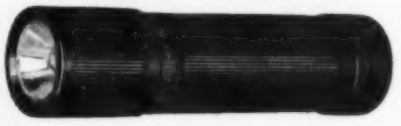
Bond Insulated Flashlight Cases



A NEW flashlight case designed especially for heavy service and work around transmission lines, bus bars or other electrical circuits is being introduced by Bond Electric Corporation, Jersey City, N. J.

Known as the Bond "Voltpruf", this flashlight has a heavy ribbed fibre case entirely devoid of metal parts on the outside. It is heavily insulated and circuits of 16,000 volts cannot break through to the internal circuit of the flashlight, nor can any damage result from accidental contact with electrical circuits.

The heavy, ribbed tube is strong to withstand heavy service, affords an excellent grip, is not cold to the hands and is unaffected by oil or gasoline. A rugged, internal switch further insures long, satisfactory service. Bond "Voltpruf" Flashlights are available in focusing spotlight and spreadlight types.

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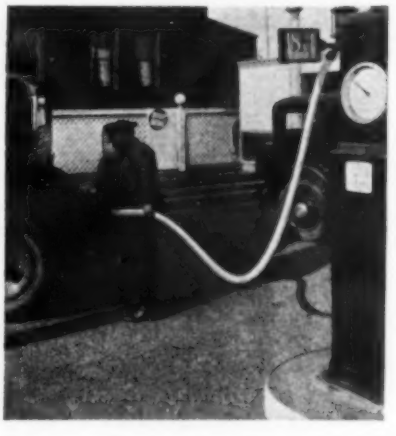
Gasoline Hose by Thermoid

IN a recently issued catalog, Thermoid Rubber Company announces the addition of a gasoline hose to the line of its Automotive Division.

The tube has been especially compounded by the Thermoid laboratories to withstand the deteriorating effects



of gasoline. An inside wire reinforcement prevents the tube from swelling and a layer of duck between the wire and the tube prevents deterioration from the gasoline.

Four plies of heavy duck have been used to assure maximum strength and service without sacrificing flexibility. For complete details address Thermoid Rubber Company, Trenton, N. J.

A BLOW WITHOUT A DENT

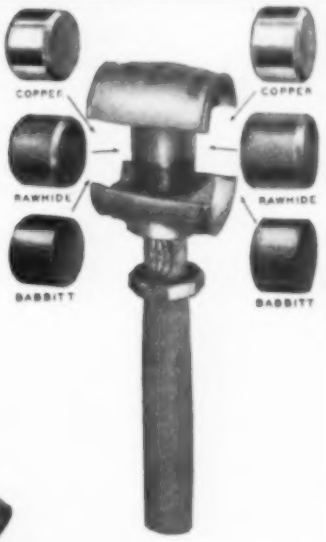
TAKE NO CHANCES OF DAMAGING FINISHED SURFACES

USE the

"BASA" HAMMER

BASA HAMMER

strikes blows of varying hardness without marring surface



Each size hammer has the proper balance, so that the blow struck may be properly measured to give the desired force without injuring the surface struck.

Send for full particulars.

The Rawhide, Copper and Babbitt Faces make it possible to adapt this hammer to any class of work.

GREENE TWEED & CO.

Sole Manufacturers

109 Duane St., New York

Operating a Bakery Fleet

(*Continued from page* 16)

afternoon when the trucks start coming in, and fills the trucks with gasoline, oil, and water, and then later on in the day he greases trucks and changes oil as per schedule laid out for him by the foreman. The car washer comes in about three o'clock in the afternoon and starts washing cars until he is finished.

This briefly outlines a typical garage crew. The size of the crew, of course, varies with the size of the fleet, but they all average close to 12 trucks per man.

When a truck comes in from the route the salesman fills out a card in which he reports anything that he may think is the matter with the truck. If he hasn't anything to report, he just signs his name on the card. On this card is also recorded the truck number, the speedometer reading, and the amount of gas and oil put in. If repair work is necessary, the mechanics show the time and the parts put in on that particular truck, showing it on this card. In that way practically all of the time, parts, gas, oil, etc. is accounted for, and each truck carries only its own expenses. Both sides of this card, entitled "Salesman's Daily Report on Automobile" are illustrated within this article. (See page 14 and page 16).

These daily truck cards go to the plant office where they are recapitulated. Every four weeks the "recap" is sent to the General Office Accounting Department. The Accounting Department ties in these reports with the general account so that we get an accurate story of costs. At the General Office Accounting Department depreciation charges and fixed charges are made against each truck, and a 4-week period report is made on a specially designed form for this purpose. A copy of this form is then sent back to each plant for the plant manager's and garage foreman's information.

(And for *your* information, it might be well to illustrate and describe the forms just mentioned. This will be done in full detail in the next issue of this publication. Each of the columns has its own heading and each heading will be fully outlined. When you have read it, you'll have a mighty fine idea of the cost-keeping system in use by the Schulze Baking Company's fleet.—THE EDITOR.)

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Preventive Maintenance Proves Itself

(*Continued from page* 19)

Before putting this truck back into service, in addition to new oil in the motor, the gasoline and oil were treated with a special break-in oil before starting the motor. Compression pressures in lbs. per sq. in., both before and after reconditioning were as follows:

Compression	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Before	82	72	73	77	72	72
After	70	70	70	70	70	70

The conclusions arrived at in connection with the results found in the foregoing investigation, are that the present-day truck chassis can be operated for at least 100,000 miles without repairs or replacements, extensive motor repairs or overhauling, excepting valve grinding every 30,000 miles, providing that certain preventive maintenance operations are carried on throughout the entire period of operation. Part of this preventive maintenance procedure as practiced by our fleet was given last month, in the form of an article on rust-proofing. The balance of

Who Uses HALL ECCENTRIC Valve Seat Grinding Method ?

Since the above cut was made, STUDEBAKER, LINCOLN and AUTOCAR have adopted ECCENTRIC grinding.

BEFORE you buy a Valve Seat Grinder, ask yourself these questions: Why have leading car and truck factories adopted ECCENTRIC grinding for production; Why have leading Fleets as well as thousands of car and truck Dealers and Independent Service Shops adopted ECCENTRIC grinding for service? Because no other method stands the gaff and gives production accuracy and finish in any metal from cast iron to stellite with such dependable, trouble-free service, such freedom from stone breakage, such grinding speed and so little grinding wheel wear.

Model E-S
Service type Grinder identical in principle with production Grinder. Comes complete with Diamond Dresser Stand, less pilots and wheels or in a variety of complete sets to meet any requirement.

Costs But a Few Dollars More

The first cost of the ECCENTRIC is a few dollars more than other type grinders but the time it saves, its extreme accuracy, its ease on grinding wheels in wear and breakage and the much less frequent need of dressing wheels, make the ECCENTRIC far more economical in the end. If your Jobber can't serve you, write the factory and we'll see that you get complete information in a hurry.

HALL MANUFACTURING CO.
1620 Woodland Ave., Toledo, Ohio
In Canada: Walkerville, Ontario

ECCENTRIC **HALL** PRINCIPLE
Valve Seat Grinder

this preventive maintenance practice will appear in the next issue of this publication, in the next of our series of articles.

●

Passenger Cars for Commercial Use

(*Continued from page* 20)

in weight, due to employment of better and lighter materials and further due to the realization of bus operators that smaller capacity busses were more economical to operate and better fitted their average seating demands.

There comes a time in the life of every type of machinery or equipment when no amount of finesse of detail will overbalance the basic advantage offered by equipment of more sound design. The passenger cars, trucks and busses that are now available and those that are to come will be the new tools of the fleet operator and these combined with intelligent operation will bring transportation costs to lower levels than we have ever previously attained.

●

What We Expect in a 1½-Ton Truck

(*Continued from page* 22)

Turning now to the instrument panel, most fleet operators, we believe, would like to see nothing but a speedometer, oil gauge and ammeter. Leave the rest of the fancy doodads on the passenger cars. The individual car owner who does not sit behind the wheel to make a living has much more time and leisure to admire such beauty before him, than the hustling truck driver, who sometimes must also be a salesman.

And, since we're making up this little 1½-tonner to order, let's suggest 32 x 6.00 tires all around, and not 34 x 7.00 or 18 x 6.00.

Last, but not least, give us a truck that is easy to work on, so as to enable us to keep it on the road as much as possible. Altogether too much time is being wasted in trying to get at parts to be repaired, all because of inaccessibility.

Of course any fleet operator or maintenance superintendent can most likely add lots more in the way of suggestions to this, our ideal 1½-tonner. Just ask any man in charge of a fleet and you'll get plenty of kinks to be ironed out. You'll get plenty of opinions and many pros and cons.

We don't say that any one manufacturer should build this truck just for us, but we do say that the truck manufacturers can help a lot more than they are now doing. The *average* 1½-ton user does not want a revamped 3-ton chassis, neither does he want a streamlined passenger car job. He wants a 1½-tonner to meet his own individual requirements, and not the other fellow's. (But who is the average 1½-ton user?—EDITOR).

●

What Gear Ratios for Sales Cars?

(*Continued from page* 24)

signed to drive their heaviest model sedans up a 13% grade in direct drive. A further analysis showed that there is only 3,700 feet of roadway in this city with a 13% grade. The balance of the grade driving, when encountered, never exceeded a 7% grade. The U. S. Bureau of Public Roads tells us that the average grade throughout the country is but 5%. Our tests also disclosed that less than one-half of one per cent of all the mileage covered by this fleet is done on roads whose grades exceed 7%. It was also found that "traffic" driving for the average car never exceeded 2% of the

mileage that the average car is driven.

In order to give these cars power enough to drive their heaviest models up 13% grades on direct drive, it was found that they used gear ratios requiring their engines to revolve on an average of 3,085 times to move the car one mile. On the other hand, when we changed gear ratios (and it took many changes) we discovered that if the gear ratios were made suitable for the average commercial passenger car to negotiate a 7% grade, it would reduce the number of engine revolutions per mile to 2,300. A car so geared would drive a 5-passenger sedan up a 7% grade on direct drive at the rate of 35 m.p.h. When we attempted to make the 13% grade it was necessary to shift into second gear.

We also discovered that in traffic driving it was necessary to remain in second speed on an average of but two seconds longer. We discovered that in driving from Cincinnati to Cleveland, we could drive 98% of the time in direct drive, only shifting in congested districts to second gear.

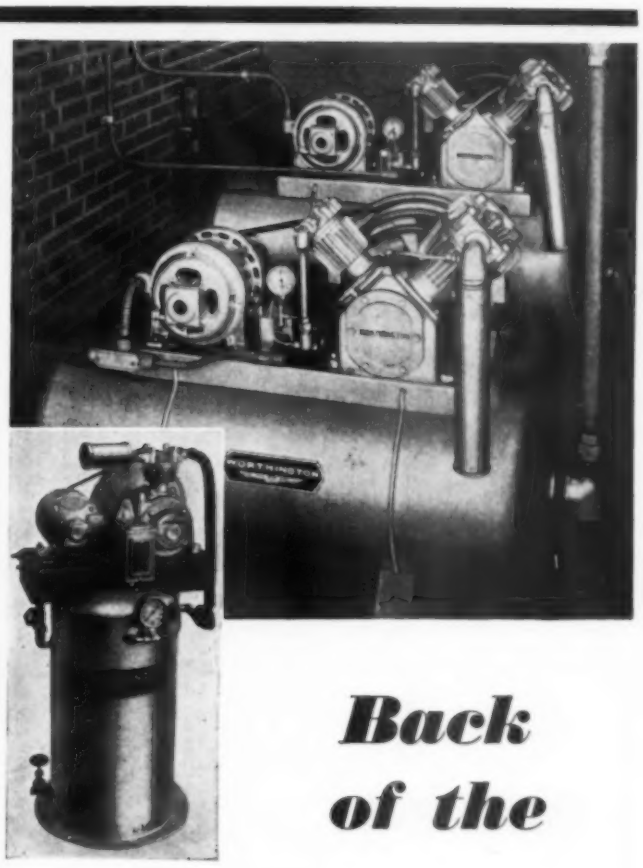
These experiments have convinced us that if fleet operators are looking for a *real* way to reduce their transportation costs at least one cent per mile, which to the average fleet operator means a great deal, there is no more definite way to do so than by suiting the power delivery of the cars in each fleet to the service demanded of them, rather than to continue the use of cars that are over-powered to super-perform under extraordinary conditions because the manufacturers must design them so, in order to sell them to meet the demands of John Q. Public.

As to a specific average of the three cars in question, by changing to the suggested ratio, it changes the engine turn-over per mile from 3,085 to 2,300 revolutions. This is the *average* of the three; they all require different ratios from one another; we are simply mentioning the average figure for comparative purposes. On the assumption that the average commercial passenger car travels 30,000 miles per year, this represents a saving in engine revolutions to the tune of 23,550,000.

There is nothing mysterious about this suggestion. It simply involves changing a few teeth in the rear axle gears. All that it requires is the advice of some engineer as to which is the correct ratio for each particular model, and most fleet managers are engineering-minded sufficiently to figure this out. The formula that the writer has devised fixes this in a definite way, free from all guess.

In conclusion, it might be said that two of the largest manufacturers of passenger cars have recognized the above facts, to the extent that they are now offering optional gear ratios, pointing out the savings in fuel consumption, etc. Therefore, Mr. Fleet Owner, if you want a *real* way to cut down operating costs, there it is. Do you know of any better way to save from $20,000 to $30,000 each year for every hundred cars in your fleet?

(EDITOR'S NOTE: Before agreeing to publish this article, we prevailed upon the author to assure us that he has *nothing to sell.* If you want any further information, we shall be glad indeed to put you in touch with him. At present, we do not know of any manufacturer making rear axle gears in various ratios as a stock proposition, to meet any and all demands, but this is not beyond the realm of possibility. Therefore, if you do make inquiry and it is passed on to the author of this article, he has promised that you will not be obligated to purchase anything, either in service or merchandise.—H. C. F.)



Back of the

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A-34108

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General Offices: HARRISON, NEW JERSEY
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AIR-MAZE

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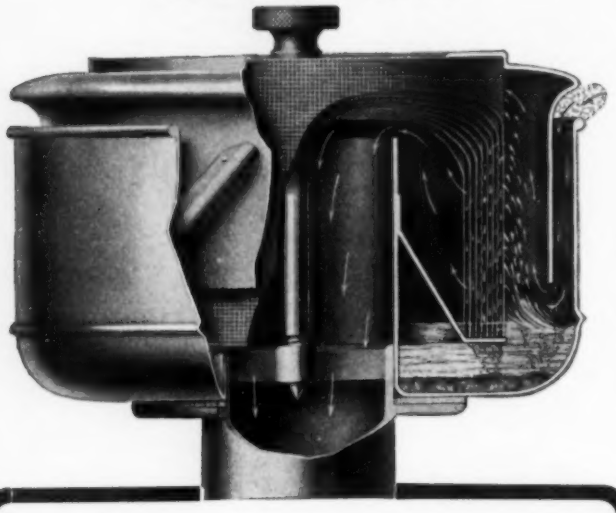

Stop Paying the HIGH Price of Dirt

There's dirt in your cost facts.

But you can make it pay dirt.

For dirt is a splendid thing in its place . . . but that place *never is* in any automotive engine.

Yet it gets there in tremendous quantities. It comes in . . . right through the carburetor, with 8400 gallons of dust laden air to every gallon of gasoline. And it raises havoc with the engine and keeps your maintenance costs much higher than they should be.

And that's a foolish state of affairs when an Air-Maze will eliminate the dirt and save you a cent or more a mile in operating costs.

Simply calling a device an air cleaner doesn't make it one. Look closely at the cut-away picture of the heavy duty, Oil Bath Air-Maze shown above. Note the patented mesh screen filter baffles. You won't find them in any other air cleaner ever made.

Be fair to your engine. Write at once for the Air-Maze cost reducing data . . . the most welcome money saving information ever placed in the hands of truck owners.

AIR-MAZE CORPORATION

312 Caxton Building • Cleveland, Ohio

Worn Plugs Affect Fuel Consumption?

(*Continued from page* 30)

spark plug can be seen occasionally, instead of at the electrode gap. Also, plain spark missing can be observed, especially at low engine speed.

It is possible to explain why this loss of power sometimes exists when your hearing does not sense engine missing, by remembering that at 3,000 r.p.m. an eight-cylinder engine produces an exhaust roar or note of 200 cycles per second. Our ear is sensitive to the changes of pitch of this note, but will not perceive an intermittent missing of one cycle.

●

Developments in Hard-Facing of Parts

(*Continued from page* 32)

heat, as in the iron and steel, and coke and gas industries, hard-facing has proved to be doubly valuable. The life and efficiency of water-cooled pokers, coke pusher shoes, hot shearing knives, hot forming and trimming dies, carbon scrapers, tap hole augers and mill guides are greatly increased by hard-facing. While it is true that many of these applications are already widespread throughout the industry, the important fact is that the use of this application is increasing in those places where it was not known before.

In the mining industry where abrasive action is particularly severe, an interesting application has developed. This is the hard-facing process applied to such parts as undercutter bits. Exhaustive tests have been run in many mines during the past year with the result that many large mining companies have standardized throughout all of their projects on the use of hard-surfaced undercutter bits.

With the necessity in the agricultural field of cutting costs to the very minimum, hard-facing has naturally found wide use during the past year. Agricultural implements of all types including plow shares and disks, corn planter runners, subsoil teeth and grain pulverizer hammers have been found to have much longer life when hard-faced.

In the power field the application is also spreading. Aside from the gate and globe valves for high temperature and high pressure steam service already mentioned, gas and oil needle valves and nozzles, pulverizer hammers, and boiler tube cleaners are being hard-surfaced with excellent results.

The acceptance of hard-facing during the past few years is a direct result of the inherent economies of the process. Of primary importance is the longer life of hard-faced parts, which means fewer replacements, with resultant savings in labor charges and lost production. Hard-facing permits the utilization of cheaper base metals for wearing parts and a further saving lies in the possible salvaging or reclaiming of worn parts. The efficiency of hard-faced parts is improved because these parts remain in better condition. The net result of these cost-reducing features is a general increase in operating efficiency.

●

F. T. C. Rules on Reconditioned Spark Plugs

SELLING reconditioned spark plugs without plainly marking them as having been repaired or reconditioned was prohibited by the Federal Trade Commission in a cease and desist order against a Minneapolis dealer, recently.

It is charged that this firm bought large quantities of scrapped spark plugs of a popular make at nominal

prices from garage keepers, junk dealers and others, and then reconditioned them for further use.

These plugs carried their brand names but purchasers were not told that they were used or defective plugs which had been reconditioned, the Commission charged.

O. C. Rohde, chief engineer of the Champion Spark Plug Company, said that with this ruling, fleet operators should be more than ever vigilant against buying reconditioned plugs at so-called bargain prices. Mr. Rohde says on the matter of reconditioned plugs: "There are three major reasons why these plugs do not give satisfaction. They are, first, improper assembly; second, gas leakage due to improper assembly; and third, improperly set gap between electrodes and side wires.

"The relation between spark plug shells and insulators is very definite," he said. "Each insulating core is especially designed to operate in a certain type of engine. In addition to this, the metallic shell of the spark plug is carefully prepared to function with a certain type of core and no other. When these reconditioned, second hand plugs are re-assembled the parts are selected at random and no thought is given to the fitness of the shells and cores with each other. This results in gas leakage to an astonishing extent.

"Out of all the re-claimed plugs tested, almost every one has shown a leakage of 50 cubic centimeters per minute or more. When you consider that a gas leak of 5 cubic centimeters per minute will increase the tip temperature of the spark plug core from 30 to 50 degrees you can imagine the tremendous overheating with a 50 cubic centimeter leak. Is it any wonder that these plugs break up and cause trouble because of excessive heat? Add to that the fact that excessive heat in a plug causes pre-ignition which increases the temperature of the entire combustion chamber tremendously and you can readily picture how much damage to the pistons and valves may result."

●

Camel-Backs Interest "Met" Section, S.A.E.

ALMOST 300 members and guests of the Metropoliton Section, Society of Automotive Engineers heard Joseph Geschelin and other prominent members of the Society describe and give the reasons for the camel-back type of truck at the regular monthly meeting of the Section held in New York last month. Two past presidents of the Society, B. B. Bachman of Autocar and A. J. Scaife of White, were the principal discussors and they both commended the excellent paper and found very little to criticize with the conclusions reached.

In opening the meeting, Capt. W. C. Thee of the Quartermaster Corps, U. S. A., showed films of the latest standard army trucks in service over rough and muddy roads such as are likely to be encountered in war service. Merrill C. Horine of Mack Trucks acted as chairman of the meeting and conducted the discussion which he introduced by contrasting the comfort of the modern truck cab with the poor seats and discomfort of early trucks.

In presenting his paper, Mr. Geschelin made it evident that legal restrictions were largely responsible for bringing about the general adoption of cab-over-engine construction; but showed that this construction also brought worthwhile engineering and economic advantages, sometimes permitting greater carrying capacity and often resulting in a more nearly uniform load on each wheel. It appeared to be the concensus of opinion that, although power steering brings certain advan-

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A SENSATIONAL new development that will cut your costs in half and give you 100% better results.

Out of the *Steelcote* laboratories comes this new spray black . . . a blacker black with a glass-like sheen . . . a black that only the *Steelcote* process can produce.

Best of all, it's a 3 for 1 black . . . you get three gallons of material by thinning one gallon of lacquer with two gallons of *Steelcote* thinner. Think what this saving means . . . cost reduced more than half.

Steelcote 3 for 1 is a heavy duty spray black. It stands up under punishment . . . does not chip, check or peel. And it's the blackest black on the market.

Write for a sample of 3 for 1 Spray Black and *Steelcote* Lacquer Thinner. Try out this sensational new product and see the results you get . . . the economy it offers. Write today for a generous sample.

STEELCOTE MANUFACTURING COMPANY
3480 Gratiot Street, St. Louis, U. S. A.

Steelcote HEAVY DUTY LACQUER

CHARTER DRIVE
IMPROVED

—with all the basic principles and advantages retained.

1. New Spring — double coil — five times the life and strength
2. Simplified Installation — entire unit locked together

All the Old Advantages:

1. Does Not Stick or Jam — not affected by oil, grease or cold weather
2. Does Not Chew Flywheel starter gears — reduces maintenance costs and eliminates cranking hazards

Patented
Sept. 22, 1925 No. 1554623
Aug. 28, 1928 No. 1682368
Aug. 1, 1933 No. 1920187

List **$7.50** for most models

Only 4 major parts

Replaces without mechanical alterations

CHARTER DRIVE DIVISION

Burgess - Norton Mfg. Co.

Licensees
545 PEYTON STREET
Geneva, Ill., U. S. A.

Nationwide Distribution

tages, it is not essential for front axle loads up to 9,000 pounds.

Mr. Bachman expressed his satisfaction over the fact that so many companies are now taking advantage of the inherent advantages of a type of construction which his company has long advocated. He mentioned the benefits of flat opposed engines of large size especially in bus service, but said there is often insufficient room for them in trucks, especially when the latter have short wheelbases and the engine must be mounted back of the front wheels and under the frame of the truck.

Mr. Scaife showed slides indicating how changes in axle arrangement affect axle loading and said that trouble from heat in the cabs of the close-coupled arrangement favored by his company had been avoided, the cabs being cooler than with some other forms of construction. Maurice Walter, of the Walter Motor Truck Company spoke of his experience with heavy loads on front axles and said that they tend to promote better riding and do not make steering too difficult.

●

Drivers' License Laws Needed

THE need for drivers' license laws in all states is stressed by R. A. L. Hogan, vice-president of The Greyhound Corporation, in a paper read before the Society of Automotive Engineers, recently.

Drivers of privately-owned automobiles have had no special training, such as the driver of a vehicle operated in a fleet. They therefore have never considered the safety angle in the same degree as the commercial driver. A properly designed drivers' license law will inculcate in every driver's mind the importance of safety and courtesy on the highway. The protection of the rights of all users of the highway by state police or other police officials is the next move.

The careless or reckless bus driver or truck driver is disciplined by his boss, but the private owner has no discipline unless it is by education through a drivers' license law or by the police. Discipline has a wholesome effect on all drivers.

In connection with the above, it is interesting to note that, in the states where drivers' license laws are now in effect and where the state police are active in administering this law, there were 31 per cent fewer automobile accidents in those states since the passage of the drivers' license laws than would have occurred if the deaths in those states had contained at the same rate as in the states where they had no such laws.

The automobile because it is cheap, fast and economical to operate has caused most Americans to want to be in a hurry. In the right hands the automobile has been a boon to our national life; but in the wrong hands it has become a weapon of destruction. There are about 26 million automobiles in the United States. Many of the drivers of these cars know little or nothing about their operation, and therefore are a real menace on the highway. Highway accidents involve some definite factors. They are the vehicle, the highway upon which they operate and the driver. The proper design of the automobile and the construction of the highway will contribute largely to the safety factor in the operation of automobiles.

Increase of speed of automobiles demands increased safeguards in the car and on the highway, as well as increased ability and care on the part of the driver.

Compulsory inspection of brakes and headlights ought to be a requirement in all states, but the real danger on the highway is neither the road nor the car, it is the driver.

Do We Want 1200-lb. Automobiles?

(By an Automotive Engineer)

AS an automotive engineer, I have been highly amused—somewhat ironically, it is true—to find that practically every automobile manufacturing concern in the United States has the same chief engineer. What makes it even more strange is that the chief engineer is no engineer at all. He is not even a graduate of a technical school. His name is John Q. Public. For obvious reasons I am making this little diatribe anonymous. Perhaps no one will publish it. Yet it is something I would like to get off my mind because if it is published it might provoke a logical answer and I would like to hear it. (So would we.—Ed.)

At the meetings of the Society of Automotive Engineers, of which I am a member and in fact a past chairman of one of its important sections, I have listened to excellent discussions on methods of obtaining superior performance and economy in our automobiles. As an engineer I know that this matter of performance from an acceleration and hill climbing standpoint as well as from an economy standpoint involves the matter of weight. I have heard of new methods of utilizing stainless steel which would permit this light material to be used, at least, in our more expensive cars to cut down the weight. I have seen in the railway fields streamlined trains of aluminum and stainless steel developed to cut down the weight-per-passenger to a minimum in order to gain speed and economy.

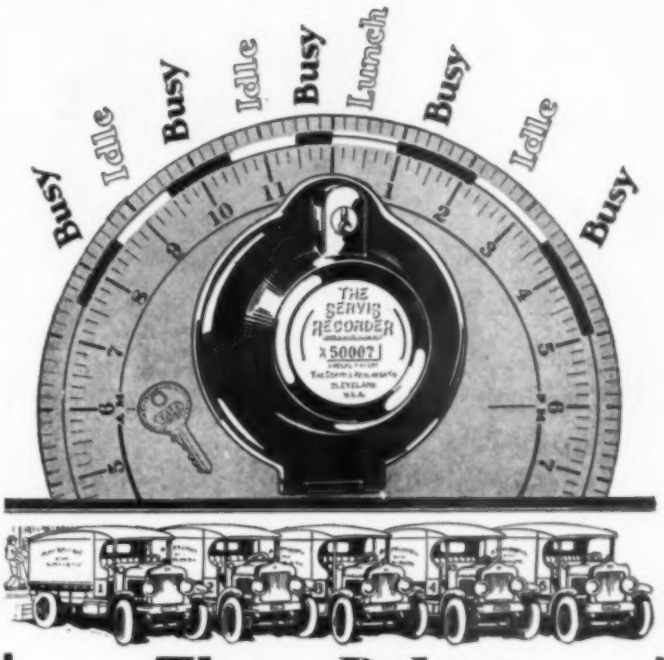
In a word, I have seen the whole trend of engineering in the transportation field move toward the goal of greater efficiency by cutting down the weight-per-passenger and weight-per-horsepower. To put this in another way, if I were not permitted to see the new products of automotive engineering and if I were to judge the products only from what I have heard for the past three years in the meetings of the engineering societies devoted to this branch, I would be led to the belief that we were building lighter, faster and more economical cars developing a much higher transportation efficiency.

What do we see? We find that the brilliant ideas evolved in the engineering brain have not been okeyed by chief engineer John Q. Public. Instead of this we find that chief engineer Public has been solely imbued with one idea. This idea may be summed up in what he himself terms the Big Package!

So, this being the age of dictatorships and John Q. Public being the dictator, the Big Package idea prevails. Still we must have performance, so naturally along with this big package goes the big engine. Horsepower has moved up from an average of approximately 10 to 15 horsepower per passenger—in other words, a 50 per cent increase in the horsepower necessary to transport each passenger in spite of the improvements in engineering!

Again with our "better engineering" we find it is necessary in the new cars to have from 30 to 40 more pounds per passenger! Where, oh where, is that advance in efficiency of which we hear so much at our engineering meetings?

No wonder we desire to remain anonymous when we make bold to ask the question, when is chief engineer John Q. Public going to be let out and the technically trained engineer take his place? In more than one field today John Q. Public has been given his dose of castor oil, that is, he has been made to take something that is good for him even if, at the time, he did not like it. Does he really want 1200-pound automobiles that will operate on less than 20 horsepower? Is this transportation efficiency?



These Delays STARE Out at You

WHEN a motor truck *wastes time*, it wastes it at the rate of from $3.00 to $5.00 per hour!

That's important money, especially in these times.

Seeing Is Correcting

These delays—half an hour here, fifteen minutes there, an hour somewhere else! One thing is certain, you never realize them until you *see* them.

But when you do see them in picture form (like the chart below) then and only then do you start to eliminate them.

All You Need Is a Screw Driver

The little *Servis Recorder* that produces this "Busy-Idle" chart is attached to the truck merely by a couple of screws—why, you could *nail* this *Servis Recorder* on your truck and it will give you every day this "picture" of the work your truck did during the past 24 hours (also 3-day and 7-day models!).

This chart shows up all the delays. Here's a stop of 2 hours!

And besides getting a real day's work out of each truck, you correct such abuses as Speeding, Overtime, Night Work, etc. Send for the whole story today. Use the coupon below.

THE SERVICE RECORDER CO.
CLEVELAND, OHIO

THE SERVIS RECORDER
"Keeps Trucks Busy"

THE SERVICE RECORDER CO
1422 Euclid Ave., Cleveland, O.

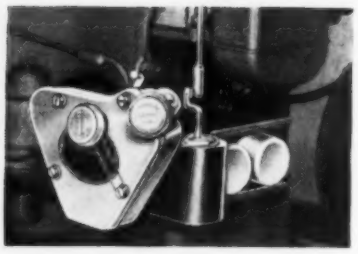
Please send us, without obligation "10 Ways of Getting More Work out of Motor Trucks."

Company.....

Attention of.....

Street.....

City & State.....



Handy Alone Governs the New V-8 Without Wasting Fuel!

FUEL FLOW—NO GOVERNOR

FUEL FLOW—HANDY GOVERNOR WITH REGULATOR

FUEL FLOW—BEST GOVERNOR WITHOUT REGULATOR

To operate the Ford V-8 engine with wide-open carburetor throttle, as other governed trucks are driven on open road, means appalling waste of fuel. Gasoline feeds for perhaps 80 miles an hour; truck speed is held automatically around 40.

Handy, alone, among governors, solves this problem. We solve it with a built-in control that regulates the V-8 power jet to feed exactly what is needed, *and no more.* Fuel thus saved may total over 20%—many times the cost of a Handy Governor.

The Handy Regulator feature is fully protected. No other governor can include it.

Govern that splendid Ford V-8 truck without penalty—with a Handy Governor! Write for our folder—"Handy Alone". It tells all the facts.

HANDY

HANDY GOVERNOR CORPORATION
DETROIT, MICHIGAN

HANDY GOVERNOR

FEDERAL

(Continued from page 42)

3500 lbs.; 2-ton, 3800 lbs. Both models are built with wheelbase lengths of 137", 153", 162" and 174". The 2-ton chassis is also available with a longer wheelbase of 187".

In appearance these trucks are similar to other models in the Federal line, having the new V-type sloping radiator with grill front, and the same style streamlined hood and cowl, wide sweeping front fenders and heavy pressed channel front bumper. Standard tires on the 1½-ton chassis are 6.00/20, 6-ply front and 32 x 6, 8-ply rear, while the 2-ton model is equipped standard with 6.00/20, 6-ply single front and dual rear tires. Wheels are cast steel with demountable rims.

The 6-cylinder power plant is of the L-head type with seven main bearings. With 3⅜" bore by 4¼" stroke, 62 horsepower is developed at engine speed of 2600 R.P.M. Maximum torque is 149 ft. lbs. at 1000 R.P.M. Piston displacement is 228 cu. in. A larger engine of 263 cu. in. displacement is furnished in the 2-ton model at slight extra cost.

The water pump is gear-driven and located on the side of the cylinder block. Full pressure lubrication, downdraft carburetion, valve seat inserts and gear-driven generator are other power plant features. An oil filter and air cleaner are standard equipment. A 10" single dry plate clutch and a 4-speed transmission complete the unit power plant. An 11" clutch is supplied with the 2-ton model when the larger engine is specified.

Both models have frames of the "fish-belly" type with a maximum depth of 8½". In line with Federal practice these new chasses are equipped with full-floating rear axles. Brakes are hydraulic type with cast drums 15" diameter by 2¼" wide front and rear on the 1½-ton, and 15" by 2¼" front and 16" by 2¼" rear on the 2-ton. Other features incorporated in these chasses are: roller-bearing type universal joints, rubber-bushed spring eyes that require no lubrication and auxiliary springs on the 2-ton model.

GENUINE SKY RIDE

Here's Colloidal Graphited Oil Concentrates at a new low price level.

Sky Ride maintains new motor efficiency and pays its way in added power, saves wear and repair bills.

Try Sky Ride. Your motor will tell its own story.

Write the producers, today, for prices and information.

Excellent proposition for distributors.

THE HAMPTON-CROSS CO. Incorporated
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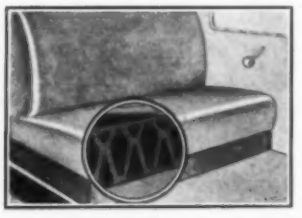
SEVERE 3-YEAR TESTS

Black Diamond All-Rubber Back and Seat Cushions

—prove they can "take it," in the laboratory and in actual use. Moulded in one-piece, patented, diamond grid design.



Write for Prices and Folder

KARPEX MFG. COMPANY
INDIANAPOLIS, IND.

Say "I saw it in FLEET OWNER"—It Helps!

COLLOIDAL GRAPHITE

Modern refining methods have enhanced to a marked degree the natural ability of mineral oils to serve as friction reducing media. But like all tools of mankind, even refined oils have their limitations.

By the employment of proper addition products, it is possible to broaden the successful use of oil as a lubricant just as certain other addition products widen the utility of gasoline as a fuel.

Electric-furnace graphite, for example (a manufactured substance, free of the abrasives which characterize the natural product) when rendered colloidal by the Acheson Process and diffused in correct petroleum bodies, provides efficient lubrication in many instances where oil alone is inadequate in meeting conditions.

Colloidal-graphited oils are especially effective when used in conjunction with regular oil for crankcase lubrication; for lubrication of the upper cylinders of internal combustion engines; for use during the assembly and "running-in" of mechanical devices and as a base for penetrating lubricants.

Send for Technical Bulletin R-92

ACHESON OILDAG COMPANY

PORT HURON MICHIGAN

There is no substitute for an Actual Test on Your Own Truck

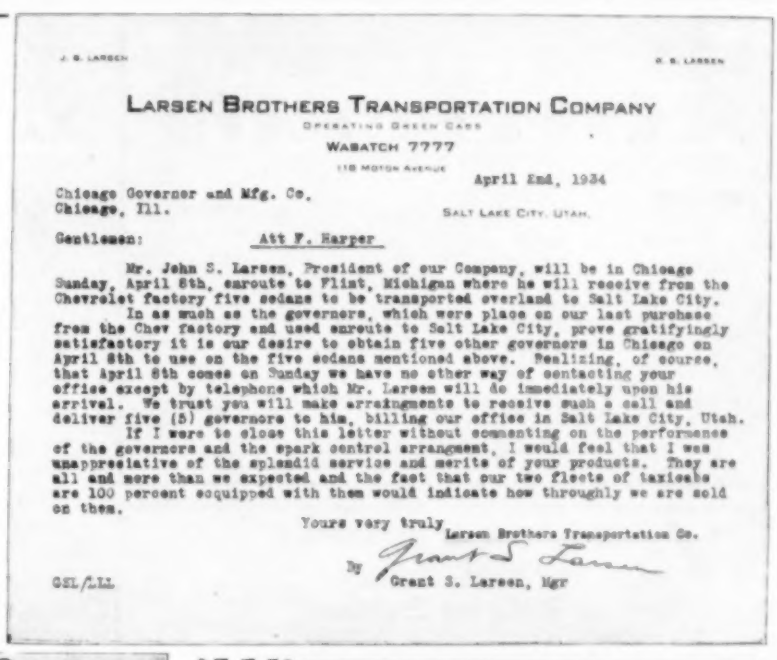
All arguments aside, the thing that is really important to you is: what will this Governor do for me on my cars and trucks under my working conditions . . . *there is no substitute for actual test.* Because we *know* what CHICAGO GOVERNORS will do we sell on the following *definite* basis:

(1st) An exact statement of Savings—see chart.

(2nd) A free test on your own equipment to prove that you will get these results.

(3rd) A 2-year Replacement Guarantee to insure the continued performance of CHICAGO GOVERNORS.

This is the distinctive difference between CHICAGO GOVERNORS and all others, *the fact that we can sell in this manner.*



LARSEN BROTHERS TRANSPORTATION COMPANY
OPERATING GREEN CABS
WASATCH 7777
110 MOTOR AVENUE
SALT LAKE CITY, UTAH.

April 2nd, 1934

Chicago Governor and Mfg. Co.
Chicago, Ill.

Gentlemen: Att F. Harper

Mr. John S. Larsen, President of our Company, will be in Chicago Sunday, April 8th, enroute to Flint, Michigan where he will receive from the Chevrolet factory five sedans to be transported overland to Salt Lake City.

In as much as the governors, which were place on our last purchase from the Chev factory and used enroute to Salt Lake City, prove gratifyingly satisfactory it is our desire to obtain five other governors in Chicago on April 8th to use on the five sedans mentioned above. Realizing, of course, that April 8th comes on Sunday we have no other way of contacting your office except by telephone which Mr. Larsen will do immediately upon his arrival. We trust you will make arraingments to receive such a call and deliver five (5) governors to him, billing our office in Salt Lake City, Utah.

If I were to close this letter without commenting on the performance of the governors and the spark control arrangement, I would feel that I was unappreciative of the splendid service and merits of your products. They are all and more than we expected and the fact that our two fleets of taxicabs are 100 percent equipped with them would indicate how throughly we are sold on them.

Yours very truly Larsen Brothers Transportation Co.

By Grant S. Larsen

Grant S. Larsen, Mgr

GSL/LL

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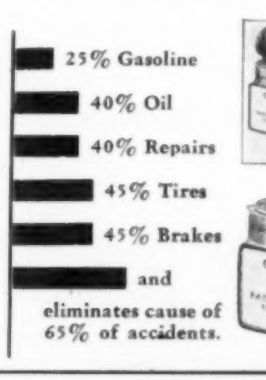

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THE MOST COMFORTABLE CUSHIONS FOR YOUR TRUCKS AND BUSES
THE SPONGE RUBBER PRODUCTS CO.
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Alcohol-Blended Fuel Would Cost More

THE use of alcohol in the United States as a motor fuel seems to be mainly a matter of economics, R. B. Gray, of the Federal Bureau of Agricultural Engineering, told members of the North Atlantic Section of the American Society of Agricultural Engineers, in session at Harrisburg, Pa., recently. Its use does not present any special mechanical difficulties, he stated, but with corn at 50 cents a bushel, a blend with 10 percent alcohol would cost the automobile operator approximately three cents a gallon more than he would pay for plain gasoline.

The use of alcohol-gasoline blends as motor fuel has come to the fore during the last year or so, principally because of the possibility of the relief it might afford to farmers in disposing of surplus agricultural products.

From available information on the performance of alcohol-gasoline blends containing up to 20 percent of absolute alcohol, there appears to be no significant differences other than what might be attributed to experimental error, the speaker said.

Gray gave in detail observations made by the bureau on performance of alcohol-gasoline mixtures compared with straight gasoline in tractors, trucks, and stationary engines, and said that, in general, there were no outstanding differences.

Reports of tractor manufacturers on the use of alcohol fuels were for the most part favorable. Two reported probable increased cost of operation; one reported greater cylinder wear due to blends, another no corrosive action found over a long period of time and smoothness of running as very noticeable; and two others reported practically the same power, acceleration and fuel economy.

In reviewing the use of alcohol in foreign countries, Gray pointed out that its use seems to be increasing to a marked degree, and that one American company in England markets an alcohol blend. The prime motive abroad for fostering the use of alcohol in motor fuels seems to have been to establish better trade balances and to aid in the disposal of surpluses from various agricultural industries.

Gray believes the investigations of various agencies into the merits of alcohol-gasoline blends, in the event of the oft-predicted shortage of gasoline, will be of considerable value.

●

Sales Executive Available (Adv.)

SALES Engineer, Member, S. A. E. and Automotive Service Association of New York; valuable business-getting acquaintance in Eastern and Greater New York territories among manufacturers, factory branches, distributors, jobbers, exporters and fleet owners of automotive, industrial, electrical, roadbuilding and contractor's equipment. Interested in either new full-time or a sideline proposition. Address H. G. S., c/o Editor, FLEET OWNER, 90 West St., New York City.

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Sales Position Wanted (Adv.)

EXPERIENCED sales representative seeks connection with automotive manufacturer as representative in the New York Metropolitan territory and vicinity. Have intimate following among fleet managers and service men. Highest references available. Address E. B., care Editor, FLEET OWNER, 90 West St., New York City.

Starters MUST Receive Proper Attention

MUCH has been written about ways and means for keeping motor vehicles out of the repair shop, of maintaining and running vehicles so as to get every mile of service that can be expected. This attitude, which is right in the main, also should be applied to the starter, because attention in the shop will often prevent breakdowns in the field.

Starter breakdowns on the road are apt to build up losses out of all proportion to the size of the starter. Working on the principle of keeping the vehicle out of the shop as much as possible, starter repairs are apt not to be made as thoroughly as possible. Usually it is easier to free a stuck starter and send the vehicle along, with a prayer that the starter won't stick, than it is to do a complete repair job. There is so much to do to repair such a small part, that there is a temptation to keep the vehicle out of the shop as long as possible at the risk of a breakdown on the road.

The man in charge of fleet maintenance must decide whether he is going to risk possible delays while the truck or bus is working, for the sake of postponing work on the starter which must be done sooner or later. In any case, the starter repair is bound to cost much in labor, in non-productive truck time, and possibly in expensive field service, at a point far removed from the repair station.

If all fleet operators carefully charged all such costs directly to starter repairs, they would realize how important is this comparatively small unit of the engine.

Direct costs also are large enough when the flywheel starter gears become worn. Replacement of a flywheel gear necessitates tearing down the engine and clutch, and the labor of reassembling after the new gear is installed. When flywheel starter gears show the first sign of causing the starter drive to stick, they should be replaced. But, because this means taking the truck out of service, the job is usually delayed until repeated sticking proves that the job must be done.

●

Taxes Burden Small Fleets, Too!

"FOR whom am I working—myself or the government?" a motor truck owner in Texas recently asked the editor of a local newspaper.

He explained that he had two trucks with a total value of less than $700, from which he hoped to earn a living, but found he must pay the government $1,266 in taxes yearly before he could have a cent for himself. He estimated his tax bill as follows:

Licenses for trucks	$150
Gasoline tax at 5½c. per gallon	1,100
Drivers' license	6
State and county ad valorem taxes	5
District school taxes	5
Total	$1,266

●

Bosch Executive Goes to Adv. Agency

JULIAN (Larry) Deane, sales promotion manager of United American Bosch Corporation of Springfield, Mass., has resigned to become associated with McCann-Erickson, Inc., New York advertising agency.

Mr. Deane has been with American Bosch for six years, and since December, 1932 has been in charge of advertising and sales promotion of the company's wide line of automotive electrical and industrial products. His resignation is effective April 1st.

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Miley products and policies are dominated by automotive men, men in the field primarily concerned with what users want, rather than by cloistered engineers assigned to develop "what we want to sell". Until you have used Ebonite or BLACK-GOLD you have yet to know "The best possible". Prove this for yourself.

Special Test Offer

Ebonite or Black-Gold will be shipped to any rated fleet operator with the understanding that if it does not improve brake action and diminish pedal fade and give more miles per dollar it can be returned any time within six months and the full purchase price will be refunded. Send for test lining today. Give make and model. Stipulate these conditions on your order.

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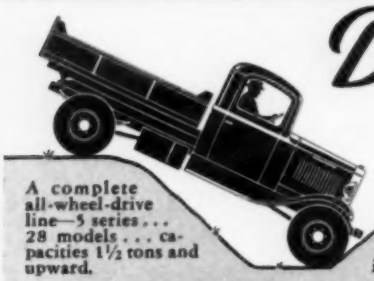

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National Governors are built to take care of the special features incorporated in carburetors on late models Chevrolet, Dodge, and Plymouth.

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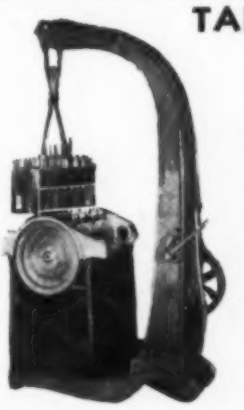

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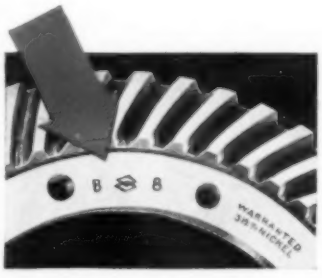

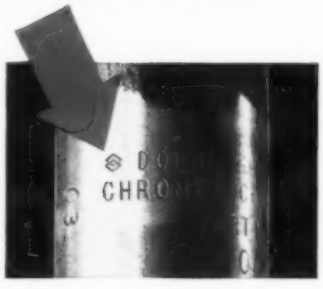

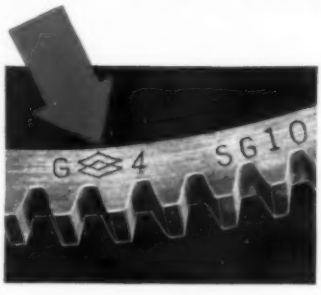

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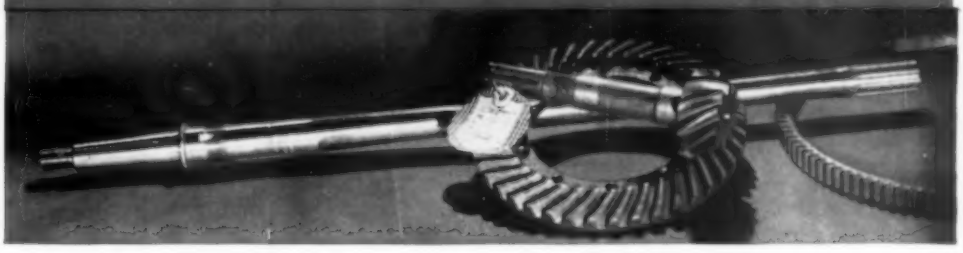

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4½ Ton

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2½ Ton

D-11
12 Ton

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4½ Ton

D8.7
12 Ton

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7 Ton

CB10.5
7 Ton

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T-7
1½ Ton

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75 Ton

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